This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

EDUCATIONAL SERIES

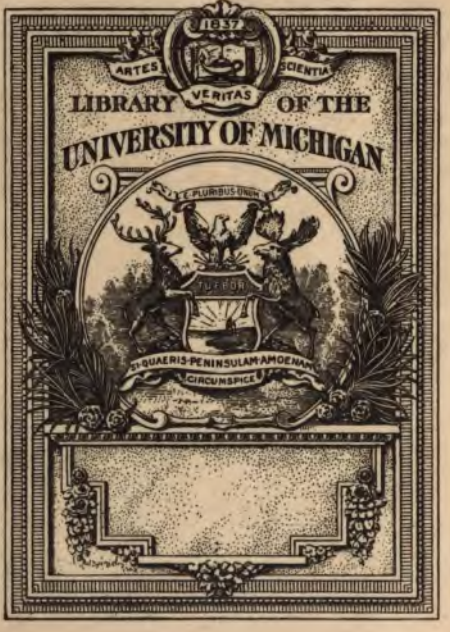
A 440164

TED BY

MARTIN G. BRUMBAUGH, A.M., PH.D.

METHODS FOR ELEMENTARY AND SECONDARY SCHOOLS

E. L. KEMP


1837
ARTES
VERITAS
SCIENTIA
LIBRARY OF THE
UNIVERSITY OF MICHIGAN
E PLURIBUS UNUM
TUEBOR
SI QUAERIS PENINSULAM AMOENAM
CIRCUMSPICE

LIPPINCOTT'S

EDUCATIONAL SERIES

EDITED BY

MARTIN G. BRUMBAUGH, A.M., PH.D., LL.D.

FORMERLY SUPERINTENDENT OF SCHOOLS, PHILADELPHIA

VOLUME XIII

Lippincott's Educational Series

EDITED BY DR. M. G. BRUMBAUGH
Formerly Superintendent of Schools, Philadelphia

VOLUME I

Thinking and Learning to Think

By NATHAN C. SCHAEFFER, Ph.D., LL.D., Superintendent of Public Instruction for the State of Pennsylvania. 351 pages. Cloth, $1.25.

VOLUME II

Two Centuries of Pennsylvania History

By ISAAC SHARPLESS, President of Haverford College. 385 pages. Illustrated. Cloth, $1.25.

VOLUME III

History of Education

By E. L. KEMP, A.M., Principal of State Normal School, East Stroudsburg, Pennsylvania. 385 pages. Cloth, $1.25.

VOLUME IV

Kant's Educational Theory

By EDWARD FRANKLIN BUCKNER, Ph.D., Professor of Philosphy and Education in the University of Alabama. 309 pages. Cloth, $1.25.

VOLUME V

The Recitation

By SAMUEL HAMILTON, Ph.D., Superintendent of Public Schools, Allegheny County, Pennsylvania. 369 pages. Cloth, $1.25.

VOLUME VI

The Educational Process

By ARTHUR CARY FLESHMAN, A.M., of State Normal School, Slippery Rock, Pa. 336 pages. Cloth, $1.25.

VOLUME VII

The Study of Nature

By SAMUEL CHRISTIAN SCHMUCKER, Ph.D., Professor of Biological Sciences in the West Chester (Pa.) State Normal School. Four full-page plates in color and 57 line drawings. 315 pages. Cloth, $1.25.

VOLUME VIII

Annals of Educational Progress

VOLUME IX

Current Educational Activities

By JOHN P. GARBER, Ph.D., Associate Superintendent of Schools, Philadelphia. Cloth, $1.25 per volume.

VOLUME X

The Conservation of the Child

By DR. ARTHUR HOLMES, Dean of State College, State College, Pa. 320 pages. 16 illustrations. Cloth, $1.25.

VOLUME XI

Principles of Character Making

By DR. ARTHUR HOLMES, Dean of State College, State College, Pa. 336 pages. Cloth, $1.25.

VOLUME XII

Current Activities and Influences in Education

By JOHN P. GARBER, Ph.D., Associate Superintendent of Schools, Philadelphia. Cloth, $1.25.

LIPPINCOTT'S EDUCATIONAL SERIES

METHODS
FOR ELEMENTARY AND SECONDARY SCHOOLS

BY

E. L. KEMP, Sc.D., LITT.D.

PRINCIPAL OF EAST STROUDSBURG STATE NORMAL SCHOOL, AUTHOR OF "HISTORY OF EDUCATION"

PHILADELPHIA AND LONDON
J. B. LIPPINCOTT COMPANY
1915

COPYRIGHT, 1915, BY J. B. LIPPINCOTT COMPANY

PRINTED BY J. B. LIPPINCOTT COMPANY
AT THE WASHINGTON SQUARE PRESS
PHILADELPHIA, U. S. A.

©1801-E.S.

EDITOR'S PREFACE

ABOVE the realm of practice in school affairs lie the great reaches of theoretic and speculative thought. To trace this upper region of ideal things is the task of the philosopher. No limits hedge him in. He ranges as he wills. His reports give us theoretic outlook, and his charts are our general guides. One may have as many theories of education as there are returning explorers with organized data.

Beneath this general range of theory and near to the processes in the school is the realm of method. In it with one's mind upon both theory and practice it is possible to carve out and set forth guidance of the most valuable and significant character. All true method is concreted law. Method puts the abstraction of the philosophic mind into workable form for the teacher in the school. These workable forms may be further reduced to a specific field of knowledge and they then become special methods. All these are valuable only as they ring true under the tests of general educational method and law.

We have been deluged with special method, so-called. Much of it has been little more than devices to catch the wavering interest of the child for a moment. Such temporal expedients do not rise to the dignity of true method and are seldom of value. They are called forth by a resourceful teacher in an instructional crisis of the recitation, and like conditions may never again arise. Any attempt to create such conditions in order to perpetrate a device is always poor teaching. It is this situation that makes for mechanical processes in the classroom and that deadens all initiative in the teacher.

On the other hand, many good teachers find the general principles of education so far removed from the field of actual instruction that it is to them a most difficult task to interpret their own procedure in the light of general law. For these a treatise on true method is of great value. To be guided in the delicate task of instruction by sane and

284757

understandable statements often gives power and purpose to the teacher's efforts. Not all teachers are competent to interpret processes in the terms of philosophy. They can, however, interpret processes in terms of sane method. The author of a treatise like this aims to carry general law near enough to the teacher's daily service to give point and purpose to instruction. The test is the old Comenian one—" Turn to Use." The only method that has virtue is one that is usable. It must fit both the purposes of the teacher and the needs of the pupil.

Whenever a method is so involved that its mastery is more difficult than is the mastery of the subject-matter it seeks to interpret, that method is bad. We have had all too many such pedagogic curiosities foisted upon the teachers of the country. Naturally and properly they shy at any newly-lauded schemes of instruction. Much has been set forth as good that really possesses but one claim of merit,—if such it be,—novelty, it is different. But difference is not the essence of progress, and novelty is a questionable virtue. To know how a child unfolds, to possess intimate knowledge of the things he should in an ordered series acquire and then to secure the maximum power of thought and expression as his unfolding spirit takes to itself what it should possess is good teaching. Only such pedagogic method as ensures this issue is commendable. A method is a way to do a thing. It is the teacher's professional tool. Its final test is, Does it work? Is it usable? Happy that child whose lot it is to fall beneath the care and culture of a skilful teacher possessed of great love and true methods of instruction.

The writer of a book of methods should be both a trained student in educational theory and also a successful teacher familiar with educational practices. We shall get little from those whose range of experience lies in special schools under conditions that are not usual but unusual. The really helpful contributions to educational procedure will always come from those wise teachers who by training and by daily participation in the usual and universal school of the people are wise enough to sense the meaning of ordinary instruction and skilful enough to formulate this daily activity for those who likewise must

teach in the best of all schools, the schools of the masses. An educational teacher or author should be an attainable presence beckoning the young and anxious teacher to the best in pedagogic method. His formulations should be so clear, so practical, so simple that those who really strive may attain professional insight, skill, and power.

The author of this volume has sensed all this in a modest, effective way. He knows the general field of pedagogic theory. He lives and works with real classroom procedure, and he is skilled in the art of lucid formulation. Here, then, is a distinctly helpful and reliable guide to the teacher whose heart is warm for childhood and whose spirit thirsts for the informing things that make for successful endeavor in the classroom.

M. G. B.

DECEMBER 25, 1914.

INTRODUCTION

THIS book has been written with special reference to the needs of young people who are preparing to teach and of the still large number of teachers who entered the profession with little or no special training for it. Its purpose is to help them rationalize the very important work which they have chosen for their own.

There are on the market many excellent works that present general theories of method and courses of study, and there are also numerous presentations of methods that are equally good; but these works generally leave a great gap between the general theory and the details of practice which is not easily bridged by those who have not had broad and thorough training and much experience in teaching. Many young teachers, in consequence, are filled with theories which they cannot translate into practice and know many methods for which they have no well-grounded reasons. The former they cannot use at all, the latter they cannot intelligently modify to adapt them to the varying needs of different pupils or of the same pupils under different conditions.

The best of the books that combine statements of theory with descriptions of practice are monographs on the different branches. In these the subjects are discussed more broadly and completely than they can be in a work of this kind. Many students of pedagogy, however, are deterred from purchasing them, because of the number needed to cover the whole field in which they are interested, or are confused by the mass of material.

In this book the author has endeavored to put into compact form what seem to him to be the things of fundamental importance in the theory and practice of the different branches of school work. He hopes that it will serve as a guide to successful and happy teaching; that it will arouse enthusiasm and stimulate thought; and that

it will suggest many things more than its pages could contain.

The first chapters are a review of such facts and principles of the general theory of method as will throw most light on the presentation of the methods in the separate branches. If they make this presentation more intelligible and useful, it is assumed that they will justify their presence.

To the workers in my profession by whom I have been inspired and from whom I have learned, I owe a great debt of gratitude, but their number is too great for personal mention. I desire, however, to make public acknowledgment of my obligation to our able teacher of literature, Miss Edna Rosenkrans, for her very careful reading of the proof sheets and her valuable suggestions for the improvement of the text.

E. L. KEMP.

CONTENTS

PART I

Principles of General Method

CHAPTER I.—General Statement of the Problem of Education 3
Need of Professional Training—Man as an Organized Being—Relation to Society—Need of Education—Definition—Relation of Education to Philosophy—The Teacher's Office—Interrelation of Mental and Physical Functions—Moral Training—Æsthetic Culture—Knowledge and Study—Branches of Knowledge—Pedagogical Science.

CHAPTER II.—Acquisition and Development..... 9
Knowledge not a Thing—Knowledge an Act—Perception not Passive Picturing—Sight of a Pear—The Distance—Other Sense Experience—The Perception—The Name—Associated Phenomena—Selection of Perceived Objects—Apperception—Review of Main Thesis—Knowledge not Transferable—Law of Development—Mental Types.

CHAPTER III.—Feelings and Volition..... 16
Important Facts—The Æsthetic Emotions—The Sciences—The Arts—Poetry—Singing—Moral Emotions—History—General Literature—Religious Emotions—Relation to Religious Institutions—Religion in Literature—The Scriptures—Relation of Singing to Morals—Volition.

CHAPTER IV.—Expression..... 22
The General Statement of the Law—Industrial Expression—Artistic Expression—School Forms of Expression—Value of Expression—Expression as Test and Stimulus—Expression as a Perfecter of Knowledge—Expression as Inspiration—Relation of Self-expression to Interpretation.

CHAPTER V.—The Correlation of Studies..... 26
The Fundamental Principle—Weakness of Old Systems—Modern Education—Primary Period of Study—Intermediate and Advanced Periods—The Correlation of Studies—The World to Be Learned—Analysis and Synthesis—Origin of the Sciences—The Same Object Studied in Different Sciences—Sciences Dependent on Point of View—Possible Concentration in Elementary Work—Concentration in Intermediate and Advanced Work—Forms of Expression.

CHAPTER VI.—INTEREST..... 34
Promptings to Action—Appetites and Instincts—Human Instincts—Nature and Origin of Instincts—Primitive Human Activity—Instincts of Children—Differences between Human and Animal Instincts—Beginning of Voluntary Activity—Relation of Interest to Appetites and Instincts—The Multiplication of Interests—Resources of Civilization—Added Incentives—The Teacher's Personality.

CHAPTER VII.—SCHOOL EXERCISES..... 40
General Law—The Exercise Instruction—The Direct Objective Method—The Indirect Objective Method—The Question Method—Question Helps to Judgment—Mental Inertness—Question Aid to Reasoning—The Teaching of Socrates—Value and Laws of Socratic Method—The Telling or Lecture Method—The Teacher a Drill-master and Expounder—The Book versus Telling.

CHAPTER VIII.—SCHOOL EXERCISES (Continued)..... 46
Testing—Tests of Power and Skill—Aids to Satisfactory Tests of Mental Power—Supplementary Tests—Testing Knowledge—A Useful Rule—The Question Method—Preparing to Test a Class—Questioning the Class—Poor Question Methods—Individual Question Tests—The Topical Method—The Examination.

CHAPTER IX.—THE DRILL..... 53
General Statement—Results of Repetition—Completed Definition—Principles to Be Observed—Drill Reviews—Memorizing Rules and Definitions—Committing Choice Passages to Memory—The Main Incentive.

PART II

THE KINDERGARTEN

CHAPTER X.—THE KINDERGARTEN..... 61
The Institution—Its Founder—His Basic Philosophy—Doctrine of Self-Activity—Phases of Self-Activity—The Law of Unity—Individuality—Nature Study—Play—Application of the Principles.

CHAPTER XI.—KINDERGARTEN PRACTICE..... 65
The Gifts—The First Gift—The Second Gift—The Building Gifts—The Other Gifts—Occupations—The Sewing—The Drawing—The Thread Game—Slat Interlacing—Paper Twisting—Weaving—Paper Cutting—Paper Folding—Peas Work—Modelling—Songs and Games—Nature Study Stories.

PART III

METHOD IN THE BRANCHES

CHAPTER XII.—READING..... 75
Functions of the Reading Class—Primary Reading—The Ends—The Incentives—The A, B, C Method—The Word Method—The Pollard System—Other New Methods—Relation of Thought to First Lessons in Reading—The Word—The Place of Oral Spelling—Phonic Analysis—The Blend—Word Drills—Expression—Intermediate and Advanced Reading—Reading as Study of Literature—Intensive and Extensive Reading—What is Literature?—The Fundamental Principles—Incidental Lessons—Recitation of Reading Lessons—Word Meaning—Incidental Helps—Reading Tests—Stimulation to Thought and Action—Memorizing—The Teacher's Preparation—Teaching "Excelsior"—The Reading of Extended Works—Supplementary Material—The Advanced Study of Literature—The First Reading—Care in Testing—Grammar and Rhetoric—Figures of Speech—Form Study—Composition Exercises—Criticism of Opinions—Memorizing—Biography—The History of Literature.

CHAPTER XIII.—ELOCUTION..... 108
Nature of It—Reading and Committing—Technical Training—Posture—Facial Expression—Gestures—Breathing—The Voice—How Voices Differ—Quality—Drills for Pitch, etc.—Laws of Vocal Qualities—Time—Elements of Time—Pitch—The Laws of Melody—Special Notes—Force—Climax—Stress—Emphasis—Guide to Emphasis—The Laws of Emphasis—Notes—Quality—Public Performances.

CHAPTER XIV.—THE USE AND SCIENCE OF LANGUAGE.... 126
Relation to Other Studies—Literature the Chief Help to Language—Growth of Vocabulary—Topical Recitations—Review Compositions—Special Language Classes—Two Kinds of Instruction—Special Composition Lessons and Their Value—Oral Exercises—Picture Lessons—Nature Study—Other Sources—Transition from Oral to Written Composition—Paragraphing—Technical Lessons—For First Grade—Drills for Capitals and Punctuation—Grammatical Drills—Second Grade Technical Lessons—Third Grade Exercises—Special Notes—Corrections—Grammar—Value of the Study—The Method—Subject and Predicate—The Noun—The Oral Series—Text-book Study of Grammar—Parsing—Analysis and Diagramming—Analysis and Parsing of Reading Lessons—Constructive Exercises—Composition—Rhetoric—Literary Structure—Nature of the Science—The Analysis—Constructive Exercises—Poetry—Correction.

CHAPTER XV.—SPELLING..... 145
Nature of the Spelling Problem—First Spelling Lessons—Oral Spelling—Two Sources of Error—Word Drill—Attention to Structure—The Spelling Match—Spelling Books—Special Notes.

CHAPTER XVI.—THE STUDY OF FOREIGN LANGUAGES.... 149
Ends—Status of Latin and Greek—Reasons Grown Invalid—Favoring Arguments—Supplementary Reasons—The Method—Need of Vocabulary—Sound Values—Declension and Conjugation—Noun and Adjective Forms—Conjugation—Translation into Latin—Notes on Form Drill—Meaning—Supplementary Exercises—Modern Languages—Reasons for Method—First Lessons—Grammatical Forms—The First Reading—The Early Grammar Lessons—Special Notes—Supplementary Exercises.

CHAPTER XVII.—PHYSICAL SCIENCE..... 162
Divisions—Value—Book Study of Natural Science—The Principle Applied—Biological Science—Phases—Nature of the Study—Human Physiology—Notes on Method—Nature Study—Ends—Relation to Teacher—The Teacher's Preparation—What Can Be Taught—Study of Domestic Animals—The Study of Birds—The Study of Insects—The Study of Toads, Frogs, and Bats—The Study of Fish—The Study of Plants—The Other Sciences—Hints for Organizing Courses of Study—A Few General Principles of Method—Suggestive Directions for Nature Study—Dandelion Seeds—A Lesson on Nuts—Beans—Melon Seeds and Corn—Winter Buds—Buds in Spring—Forest Trees—Related Insect Lessons—Butterflies and Moths—Aquaria and Breeding Boxes—A Few Suggestive Directions—Bird Study.

CHAPTER XVIII.—PHYSICAL SCIENCE (Continued)..... 181
Geography—Introduction—A Geographic Description of Kansas—The Content of Geography—General View of the Earth's Surface—The Land—Waters of the Land—The Earth Still in the Making—The Functions and Changes of Streams—Light and Heat—Temperature Conditions—Results of Temperature Variation—Combined Effects on Vegetation—Other Influences on Population—The State of Civilization—Political Divisions—Divisions of Work—Observational Geography—Application of Term—Position and Direction—Daily Changes of Temperature—The Changes of Season—Wind and Rain—Soils—Special Local Geography—Some Local Topographical Features—Some Things the Streams Are Doing—Glaciation—The Hills and the Farms—Elevation and Climate—The Mountains and the Winds—The Mountains and Industry—Other Subjects for Study—Outline for Local Geography—Geographic Representation in Language—Pictorial Ex-

pression—Map Representation—First Interpreted Maps—An Elementary Course—In the Fourth Grade—In the Fifth Grade—Fifth Grade Supplementary Reading—Maps to Make Knowledge Definite—Outdoor Work—In the Sixth Grade—The Use of Devices—In the Seventh Grade—In the Eighth Grade—Map Records—Advanced Geography—The Facts of the Science—Conclusion.

CHAPTER XIX.—HISTORY..... 210
Value—Scientific Character—Nationality in History—Universality in History—Cause in History—Historical Values—The Course of Social Evolution—Features of Social Evolution—The Factors of Historical Growth—Physical Factors—Relation to Population and Wealth—Relation to Intercourse with Other Peoples—Relation to Phases of National Development—Relation to Internal Movements of Population—Social Factors—Racial Temperament—Conquests—Evil Results of Conquests—Slavery—Hostile Foreign Relations—Friendly Foreign Relations—Immigration—The Teaching of History—Knowledge of Present Events—Social Institutions—Race Instincts—The First Lessons—Home Life—Community Life—Hero Tales—Pioneer Adventure and Biography—The Middle Ages and the Beginning of Modern History—The Method—Systematic Study—Supplementary Reading—Topical Outlines—Civil Government—General History—Special Features—Drawing of Maps—Picture-Making—Wars—Later Study of United States History—The Central Interest—The Incidental Interests—Discovery and Colonization—The Colonies—Immigration and Annexation—Lines of Expansion—The Making of the Pathways—Slavery—Our Wars—Industry, Commerce, and Transportation—Education, Literature, and Art—Growth in Nationality—The Status of the Individual—Time to Teach—Our Later History—Intensive Study.

CHAPTER XX.—MATHEMATICS..... 240
Quantitative Knowledge—Relative Value of Mathematics—Guarantee of Results—Arithmetic—The Definition—Number—Generalization—Discrimination—Relation—Units—Composite Units—Fractional Units—Purpose of First Lessons—First Lessons—Content of Number Concepts—Exhaustive Teaching—The Method—Simultaneous Operations—Teaching Multiplication and Division—The Writing of Numbers—The Arabic Notation—Drill in Number Recognition—Concrete Work of Second Year—Abstract Numerical Ideas—Use of Figures—Addition and Subtraction Tables—Multiplication and Division Tables—Use of Multiplication Sign—Arithmetic as Science—Making Addition and Subtraction Intelligent Processes—Understood Multiplying and Dividing—Number Analysis—First Fractional Units—First Lessons—The Writing

of Fractions—First Operations—Division—Fractions of Numbers—Decimal Fractions—Definitions and Rules—Applications of Arithmetic—Mental Arithmetic—Drills—Mechanical Drills—Thought Skill—Explanations—Proofs—Algebra—The Basis of Algebra—Fundamental Features—Negative Quantities—The Equation—Introduction to the Equation—Other Arithmetic Problems—Kinship to Arithmetic—Relation of Parts in Algebra—Geometry—The Study—Form Study in the Kindergarten and Grades—First Demonstrations—Definitions—The Order—The Method—Benefits of the Study—The Text-Book.

PART IV

THE PRACTICAL ARTS

CHAPTER XXI.—THE MANUAL ARTS 277
General Use—The Basis—Penmanship—Conditions to Good Penmanship—Movement and Position—The Front Position—Side Position—Pen Holding—The Movements—First Writing—Movement Drills—The Rules for Height—Small Letter Drills—The Capital Letter Drills—Concluding Remarks—Drawing—Guide to First Lessons—First Lessons in Drawing—The First Instruction—The Nature Study Class—Illustrative Drawing—The Technique—Perspective—Use of Drawing Books—Mechanical Drawing—Designing—Manual Training—The Course—The Fundamental Principle—Things That May Be Done—Physical Training—Athletics.

CHAPTER XXII.—VOCATIONAL TRAINING 297
General Statement—Book-Keeping—Journalism—Domestic Science—Sanitation—Ornamentation—Needle-Work—Cooking and Baking—Agriculture—General Statement—Relation to Science—Outside Coöperation—Lessons in School—School Gardens and Farms—Orcharding—Poultry Raising—Cattle—Special Helps—Principles and Benefits.

INDEX 305

PART I

PRINCIPLES OF GENERAL METHOD

Methods for Elementary and Secondary Schools

CHAPTER I

GENERAL STATEMENT OF THE PROBLEM OF EDUCATION

THE education of the young is one of the very noblest of all arts. Among men who by devoted service and heroic sacrifice have done most for humanity, the great teachers take the highest rank.

NEED OF PROFESSIONAL TRAINING.—This art no one may expect to practise successfully without being adapted to it by the possession of varied and peculiar gifts, but yet no natural gifts are in themselves sufficient to guarantee the results to be desired in the schoolroom. No one should ask to be entrusted with so important, delicate, and complicated a task as the instruction of youth who has not received or who does not intelligently seek to acquire thorough scientific training for it. Such training is possible, because man's relation to his environment is not a matter of chance, and the proper growth of his mind and body is in harmony with ascertainable principles, or laws.

MAN AS AN ORGANIZED BEING.—The elements of the problem of education and, therefore, the guides to its laws and principles are to be sought primarily in the individual both as a growing child and as a mature member of society, and secondarily in the environment that challenges him to action. Now, it is not a new or startling thing to say, but a very important thing for a teacher to keep in mind, that man is an organized being, and that his organization adapts him to the performance of certain functions to which his own appetites, instincts, purposes, and the demands of society urge him.

For purposes of study and description we are accustomed to separate and group these functions in our thinking as they are not separate in fact. So we speak of *mental* and *physical* functions, of *emotional* states, and of *intellectual* and *volitional* activity, as mind or body, emotion, intelligence, or will makes the strongest claim upon attention. Further than this we describe functions as *religious, moral,* or *æsthetic,* as they are inspired by conceptions of Deity, duty, or beauty and the emotional conditions connected therewith. These terms, therefore, also are used to indicate corresponding dominant phases of educational theory and practice.

Relation to Society.—The value of these functions must largely be determined by man's relation to his fellows. He is born into society to be an active, integral part of it. From society he derives most of the wealth and meaning of his life, and for these he owes an adequate return. Through him it must be either richer or poorer, stronger or weaker.

Now society presents itself to him not only as an aggregate of individual men and women, but also in various forms of more or less definitely organized institutions. The most important of these are religious, civil, domestic, industrial, commercial, and professional.

Need of Education.—Man does not commence life, as do lower animals, almost immediately ready to perform his functions with ease and efficiency. He begins it as an infant more helpless than any other creature born into the world, but normally capable of marvellous growth and development. This growth may continue throughout the greater portion of his life, but a more or less extended series of its first years is preëminently the period of growth and preparation. During this period he receives, or should receive, as a sacred right, the tutelage of the various agencies of society to prepare him to assume for himself the duties and responsibilities of living. This tutelage, or conscious direction of development, is what we distinctively term education.

Definition.—With these facts in mind, we are prepared to state that education consists in so directing the development of man as to prepare him to perform the

functions of life in his maturity in the noblest way possible. It makes him strong in mind and body, and able to do things worth while. It puts him in sympathy with the things fine in nature and humanity, wakens his aspirations, and fashions his ideals. It equips him with needed knowledge and practical skill. It fits him, in short, for efficient service as a member of society, and, therefore, enables him to complete and glorify his manhood.

RELATION OF EDUCATION TO PHILOSOPHY.—Accepting the general statement of the end of education to be correct, we must recognize the fact that there will, of necessity, be as many systems of education as there are different prevailing philosophies of life and that the philosophy of life underlying the system will, in proportion as it is recognized, give tone and color to every phase of educational activity, modifying the different features of organization, discipline, instruction, and training.

In our own country we have reached a very general agreement to educate our young people in such manner that they may with strong, healthy, and facile minds and bodies, as free individuals, perform their functions as members of society perfectly and on their own initiative.

THE TEACHER'S OFFICE.—The teacher is, therefore, primarily an inspirer and director of effort in the performance of functions which are prompted by the pupil's own appetites, instincts, and desires, and by the demands of society. These functions cannot be performed in the abstract. They are reactions by the pupil upon himself and his environment. In these reactions lie the conditions to growth, supplemented, of course, by rest and nutrition.

Inter-relation of Mental and Physical Functions

The broadest and at the same time most radical distinction of functions that can be made is the distinction between functions as physical or mental. This distinction is apt to lead to the partial or entire ignoring of the demands of the body upon the attention of the educator. This is out of harmony with sound theory. A man is not a dual being, but a unit. Mind and body are so related that, generally speaking, what affects one affects the other. Physical activity nearly, if not quite, always in-

volves and modifies mental activity, and, as far as known, mental activity always involves the performance of physical functions.

It is a law that physical functions, other than purely reflex or instinctive, become most accurate, energetic, and effective when directed with the best mental effort, and mental functions can be most persistent, energetic, and effective when backed by complete physical organization, perfect health and vigor, and intelligent training.

No system of education can, therefore, be complete that does not properly affect the whole man, the man physical as well as the man mental, and give him the highest degree of efficiency.

Moral Training.—Since the man is a member of society, his education must be essentially ethical, and his moral training is of fundamental importance. The school must share principally with the family and the church the responsibility for making him strong in the will to say "no" to the temptations to unworthy self-indulgence and immoral practices, and equally strong to do the things that are worth while. It must unite with them in teaching him to recognize clearly his relations to the rest of the universe, in furnishing him with exalted ideals, and in inspiring him to make enthusiastic and energetic effort to realize them. Though it may not, as in the case of the public school, give specific religious instruction, it must always recognize the fact that in religion is the true basis for complete moral insight and action and their most perfect and effective inspiration. The world's greatest teachers have been its moral and religious reformers.

Æsthetic Culture.—Akin to the growing man's natural adaptation to moral development is his capacity for forming and realizing æsthetic ideals. This is in itself an imperative demand for its cultivation. The school must create in the youth under its tutelage an inward compulsion to neatness and finish of effort, enjoyment of the world's natural beauty and grandeur, a desire and ability to beautify environment, and, above all, an appreciation of the best achievements of the race in architecture, sculpture, painting, music, and poetry, and power to increase, if possible, its artistic wealth. Through its arts humanity

expresses much of its highest aspiration and noblest feeling and reveals the dignity of its creative power.

KNOWLEDGE AND STUDY.—However fundamental in importance these things are, and largely because of its relation to them, the larger part of the school's work is to cultivate knowledge. Knowledge is the assimilation of the experience of the race. It is one form of man's mental reaction upon himself and his environment, and at the same time an enlargement of environment. By increase of knowledge man becomes more and more intimately acquainted with ever-increasing portions of the world to which he belongs, and extends his acquaintance over ages of life that have passed away. When his intellectual reactions are inspired and directed by purpose and thus become persistent and systematic, we term them study, and so the learner becomes a student, a man eager to know.

BRANCHES OF KNOWLEDGE.—Man and his environment are both complex, presenting great varieties of elements in different forms of relationship. So there are many branches of knowledge.

His physical environment furnishes material for the biological studies, botany and zoölogy, and for geography, geology, astronomy, physics, and chemistry.

He and his fellows as individuals, and the race in the process of its development, become sources of anatomy, physiology, psychology, anthropology, ethnology, archæology, history, literature, and language. These again may become the bases of still other forms of study. Literature, for instance, naturally leads to the study of grammar and rhetoric, and the knowledge of different languages, to the science of philology.

The effort to know some things involves measurement, and measurement consists in numbering and determining extent. Thus originated the fundamental mathematical studies, arithmetic and geometry, out of which have grown the other forms of mathematical science.

The forms of reasoning by which the truth in the different sciences is established may themselves become the subjects of investigation, and so we have logic as another special branch of learning.

Further than this, intellectual activity seeks its final satisfaction in efforts to unify all its experiences and give complete explanation to all the phenomena of existence, and so we have philosophy with its special branches, ethics, æsthetics, the philosophy of history, and the crowning study of all, theology.

Besides this, growing knowledge and its accompanying wealth of emotion seek different forms of expression. This gives us the practice of various arts and professions. These again give rise to forms of study peculiar and appropriate to themselves.

PEDAGOGICAL SCIENCE.—A systematic account of the work of education is termed pedagogy. There are several branches of the science. As commonly divided, these are School Management, Methods, or Methodology, History of Education, and Philosophy of Education.

The Philosophy of Education is a general account of the ends, systems, and principles of education, and is a department of general philosophical study, drawing from it and from its special branches, sociology, ethics, æsthetics, and logic, most of its inspiration and many of its principles.

Methods, the subject to be discussed in this book, is an account of the ways and means, other than those of management, by which the ends of education near and remote may be attained. Because of the close relationship existing between ends and means, Methodology may never be entirely separated from the Philosophy of Education.

Inasmuch, therefore, as the work over which the teacher presides is done on branches of study by pupils performing physical and mental functions for the attainment of certain worthy ends, the principles and rules of Methods must be based on a sound system of philosophy, a correct physiology and psychology, and on the materials and logic of the branches to be studied.

CHAPTER II

ACQUISITION AND DEVELOPMENT

As was stated in the preceding chapter, by far the largest part of the teacher's work is the imparting of knowledge, to use an established but somewhat unfortunate form of speech. It has been his principal business through the centuries, and it would seem that by this time the nature of knowledge and its true value should be well known to the profession This, however, is by no means the case. Several fallacious opinions have persistently lessened the dignity of the teacher's office and have made much of his effort to be barren of worthy results.

KNOWLEDGE NOT A THING.—Possibly the commonest fallacy is the assumption that knowledge is something separate from the mind, an independent something for the mind to work upon and take in, a sort of commodity that may be peddled about or given away. This, no doubt, arises from the fact that knowledge may be expressed in language, and that language symbolized may be written or printed. So it is easy to think of the memorizing of the statements of books as the mastery of the knowledge which they were intended to express; but the knowledge of the name of a thing is by no means a knowledge of the thing itself, nor does it necessarily indicate the possession of such knowledge.

KNOWLEDGE AN ACT.—Knowledge is not a separable product of mental activity; it is the activity itself, or, rather, a phase of it. In other words, it is a phase of mental function. The sight of a written word or the hearing of a spoken word occasions a knowledge of the thing it names only as it excites the mind to appropriate actions, leads it to form the right idea.

PERCEPTION NOT PASSIVE PICTURING.—Another hurtful fallacy is just as natural, and is more subtle and elusive. It is the notion that in perception the mind passively receives impressions, or pictures, of the objects which hap-

pen to be present to it. Something very different is the case. Every element of every form of knowledge is an active creation of the mind made by its reaction upon objects of attention, and made in harmony with the laws of its own being and growth.

SIGHT OF A PEAR.—Let us consider this more closely. Let us say, for instance, that you see a ripe pear. An increase in the intensity of light immediately changes the color, making it a brighter yellow, and a diminution of intensity would just as quickly dull the color. A light other than sunlight might produce a very different color effect, and a modification of the structure or secretions of the eye might have similar results.

It is evident that though we speak of the color as a quality of the pear and are apt to think of it as a fixed quantity at any stage of the pear's growth, yet it really is one of the phases of consciousness due to the presence of the pear in the field of vision and to a number of other facts that condition the mind's reaction. It is, moreover, a phase of consciousness subject to variation.

The possible variations are dependent not only on objective conditions, but on subjective conditions as well. To a person depressed in spirit and moody, there is apt to be a lowered brightness of the color tone; and to a person joyous and happy, a corresponding heightening of it. So also the color varies much with the contrast to which the mind subjects it with objects just previously seen or seen at the same time.

More than this, the pear is not alone in the field of vision, and the clearness and definiteness of the color sensation will vary with the degree of the intensity with which attention is fixed upon it because of previous experience and present interest or purpose. It may be the main object of attention, and, therefore, clear and distinct, or merely incidental to something at the time much more important, and correspondingly faint and indefinite.

THE DISTANCE.—The same law of knowledge becomes apparent in considering the distance which the pear assumes. The basis of all distance perception lies in this, that the mind assigns objective reality to its sensations. This is one of the primary facts of consciousness, a revela-

tion of the native character of mind. The nearness or farness of the pear is a relative matter, a matter of comparative judgment, however flashlike the judgment may be. First, it is relative to other objects in the field of vision. In this relation it is easy to assume it to be nearer than some other object when it is actually farther, or *vice versa*. Next, it is relative to an undefined standard in proportion as it is distinct or indistinct in color and outline from varying conditions of the atmosphere or from actual nearness or remoteness, or in proportion as you are fresh and vigorous or weak and languid. Then it is relative to some definite unit of distance measurement, and much practice in the use of such unit is necessary to make the judgment at all accurate. So again the distance it assumes is a form of mental reaction varying with present conditions and past experience.

OTHER SENSE EXPERIENCE.—Very much the same account may be given of the other sensations that may be experienced with the pear as has been given of the sight sensation. It is ridiculous to think of the smell of it as a fixed something imprinting itself upon the mind through the nose, or the taste as a similar something imprinted through the mouth. For a fact, the same pear may be to the same person, under different conditions, sweet or sour, as it may through the touch be either rough or smooth, soft or hard, warm or cold.

THE PERCEPTION.—The fact that knowledge is a unique function of mind becomes plainer in studying the complete act of perception. Sensations are after all but elements of perception. For us they are perhaps never independent mental facts, whatever may have been the case when we were infants. We know them now only by analyses of complex units of experience. A sensation is a meaningless thing. Meaning is given to it by relationship to other elements of knowledge.

While it is true that in the sight of the pear the light reflected from one side produces a complex color sensation, this is a condition of knowledge only because with it, in more or less complete integration, come other elements.

If the pear belongs to a well-known species, the shape and color of the opposite side may be at the same time

present in consciousness; the taste of the kind may be so vividly present as to cause the saliva to flow; and equally vivid may be the odor, flavor, and color of the pulp, the shape of the core, the softness or the harshness of the pulp to tooth and tongue, and the feel of the skin that might come to the hand. Some or all these elements may be present at once, either faintly or clearly, but all that are, are summoned from the mass of past experience by the visible color.

Now, whichever of the elements are present in consciousness, they at the time constitute our perceptive knowledge of the pear. Our knowledge of an object is a knowledge of its qualities in relation. The number of qualities present in consciousness and the degree of vividness they possess are determined mainly by our interests at the time. So the perceptive knowledge of the same object under different conditions is a very variable quantity. When you are hungry, the taste is most prominent; if you seek objects for their æsthetic value, then the odor, color, and shape most claim attention.

THE NAME.—The perceptive knowledge of the pear is incomplete without the name, for it would so lack ease of communication. The name is either a sound symbol or a visual one. It gets its value as do the separable sensations, by relation to the other elements that constitute a knowledge of the thing. Like them, in the act of perception it may occur as a part of the complex mental act, and so it may also suggest a reproduction of some or all of the elements that have been associated with it, either separately or as an integrated whole. Only in so far as this is the case, does it have practical value.

ASSOCIATED PHENOMENA.—Perception is not always the touch-and-go sort of affair that has just been described. If the kind of pear visible is not a familiar one, the sensational elements which make it a recognized object come but slowly and with effort; and the distance is approximately determined only with effort at measurement if the conditions are unusual, as in the case of a fog or a state of bewilderment.

The ordinary psychologic account of the perception is also incomplete, because it is necessarily more or less ab-

stract. It ignores facts that may not be more separate in the experience than are the perceptive elements, as the pleasure of seeing the pear, the æsthetic enjoyment of the view as well as the anticipated pleasure of tasting it, and the will so to do.

As the perceptive elements enter into consciousness so may other related facts with perhaps neither more nor less effort. Some of these may separate themselves as distinct remembrances, as the recalling of unusual or enjoyable circumstances under which such pears may have been seen or eaten on previous occasions. So past experience may prompt to active imagination in idealizing the pear in size, shape, and color. As all these acts present elements of knowledge in relation, the mind may enter upon a series of thoughts concerning the relations, as Newton is said to have evolved the law of gravitation at the suggestion of falling bodies.

So the sight of a pear for the same person at different times might have very different meaning; and for different persons at the same time, never the same meaning, because each one is a different personality, involving a different series of past experience, different purposes, and a different present mood. After all, the perception of pear or any other object, whether by sight or other sense, is an interpretation uniquely determined by personal experiences and interests. So a musician, a poet, a painter, and an electrical engineer standing before a waterfall have separately born in their souls a harmony of sounds, a musical lyric, a flash and play of color, and a vision of power usefully applied and saved from waste.

Selection of Perceived Objects.—There is another significant fact connected with the perception of the pear on the tree that illustrates what is always the case in perceiving. The pear is not the only object in the field of vision at the time. It is possibly but one of thousands. When it is distinctly seen, most of the other objects are either very faintly noticed or entirely unseen. So the perception involves a selection of the thing perceived, as well as the selection of the elements from the mass of past experiences that give meaning to the sensation or sensations that occasion the act of perception. This selection

of the object again is determined by the mind's interest at the time.

APPERCEPTION.—The fact that the mind selects and relates the elements of its experiences and thus finds meaning in them led to the use of the term apperception, and all knowledge is apperceptive. We reproduce past experiences of any sort, and remember them only as we restore one or more of their apperceptive concomitants. We imagine or reproduce elements of experience in new relationship, and we exercise the highest type of imaginative activity when we create ideals of existence in ideal relationships. We pass to the highest type of knowing in noting the related facts of the world of mind or matter when we turn attention from the facts, or phenomena, related to the relations of the phenomena. We form concepts by acts of judgment and reason, and enrich our lives with such ideas as virtue, purity, humanity, and truth. We discover similarity and difference, coördination and subordination, cause and effect. Turning from the consideration of that which is relative, the mind finds rest and inspiration in the conception of the absolute, and passes from the study of things caused to the cognition of the Deity, the cause of all things.

REVIEW OF MAIN THESIS.—Knowledge, as has before been stated, is a phase of mental reaction. It begins in sensation and takes its first definite form in perception, because the mind first reacts upon its physical environment. After a time it reacts upon itself, and a new range of ideas and possibilities is revealed. Always the reactions are determined primarily by the mind's own nature and are governed by the laws of its being and growth. The higher forms of intellectual activity are involved in the lower, and all are based on perception; but higher orders of ideas are not mere mechanical sums of ideas of a lower, or simpler, order. Like the sensation which is not a mechanical transcript of the quality of an object, as we have seen, each order is unique and original, revealing the native dignity and supremacy of mind

KNOWLEDGE NOT TRANSFERABLE.—It is evident that knowledge is not to be transferred from one person to another. Each person has his own sensations, his own

percepts, his own ideals, his own thoughts, his own affections, his own desires, and his own volitions. Of such wealth none may either a borrower or a lender be. It follows, therefore, that each has his own peculiar life problem, his own mission. What a royal dignity inheres in this individuality. It should be respected by the teacher.

LAW OF DEVELOPMENT.—Inasmuch as feeling and willing are also phases of consciousness, phases of the mind's reaction, one law holds good for the development of mind and body, the law of exercise. We learn to see by seeing, to think by thinking, to will by willing. Similarly our feelings and emotions increase in depth and power with their expression, and so we learn to love by loving and doing acts of love. That exercise of mind or body in the performance of function may have its highest value, it must be wisely directed and inspired with the enthusiasm of a high and compelling purpose.

MENTAL TYPES.—As it is a sad and futile abuse of the teacher's office to require pupils to memorize the language of useful and interesting knowledge without helping them to realize the precious content of which it is capable, so it is also not his highest function to develop a particular set of ideas and thoughts as a fixed and final possession. It is rather to develop types of mind that, while they hold tenaciously to the fundamental intellectual and spiritual possessions of the race and are skilful in all necessary mechanical operations, yet react most readily and freely upon phenomena and conditions as they arise, with broad and certain grasp, with noble feeling, and lofty aspiration.

The school and life have the same end, the modification and ripening of personality. So not he is best educated who can see to-day the things that he saw yesterday and think to-day the thoughts of yesterday with yesterday's purpose and ambition, but he who sees to-day the things to-day makes possible to see, thinks the thoughts the conditions of to-day demand, and acts to realize the ambitions and hopes that to-day are born in his soul because of the experience of yesterday.

CHAPTER III

FEELINGS AND VOLITION

It is clear that when we speak of knowledge of any sort we do of necessity and for convenience ignore mental phenomena integrated with the acts of knowing. Our mental states are complexes. To analyze the complexes into their elements, trace the genesis of them, and determine their relations and the nature of their fusion, is the business of the psychologist.

No matter what the number and character of these elements are, they gain interest for the teacher only as they become definite in or condition forms of knowing, feeling, or volition, and there are probably no mental states with which the teacher deals into which all of these do not enter, not as separate parts mechanically joined, but as distinguishable phases of one experience. There is, therefore, no such thing as a purely intellectual education or a distinct and independent cultivation of emotion. Our emotional states are involved in our knowing and thinking.

Important Facts.—While our emotions are not separate from our thinking, they do not have the same definite character as ideas and thoughts; neither do they form such sequences, nor have such measurable relations. What emotions shall be integrated with their thoughts, how weak or intense they shall be, and how they shall influence the activities and ambitions of pupils, largely depends on the teacher and his lessons. Something depends on his method, much on his personality and his attitude towards the institutions and facts of life.

Feelings are peculiarly communicable. A smile may be reflected from a thousand faces, and one man's anger may incite a multitude to a frenzy of rage. Coldness in a teacher's voice may chill incipient enthusiasm, and a sneer upon his face may cause to seem contemptible things sacred and beautiful. A sympathetic touch of his hand may start to life a host of noble ambitions, and a few

words from his lips may increase and fix respect for all the great relations and duties of life.

In whatever way the teacher may exercise his influence on the emotions of his pupils, the influence must be good. It is still important that there be strong and habitual in men the love of God and their fellows, the honor of parents, sympathy with the unfortunate, respect of honesty and virtue, the love of home and country, admiration for heroic deeds and sacrifices, gratitude for kindness, in fact, appreciation of all virtues that ennoble life and make it worth the living.

The Æsthetic Emotions

THE SCIENCES.—Sciences like botany, zoölogy, and astronomy should increase the enjoyment of the beauty and sublimity of things in nature. It is not necessary to sacrifice the enjoyment of beauty for the sake of scientific accuracy, and it is wrong so to do. The world should be made more joyous for the student by his study. The knowledge of bird and flower should multiply the sources of joy in form, color, arrangement of parts, and in the music of nature's voices, and a knowledge of the stars should reveal more of the glory of God.

THE ARTS.—The distinctly æsthetic studies are, for girls, ornamental needle-work, embroidery, and lace-making, and for all pupils, drawing, modelling, poetry, elocution, and singing. Our teaching of modelling should prepare for the artistic work of the sculptor just as surely as it should serve for illustration or prepare for some of the mechanical arts. In a similar way drawing should have reference to architecture and painting and involve some study of both. Our architects and painters must come out of our schools as well as our mechanics and artisans, as must also they who may enjoy their productions.

Poetry.—In the study of poetry the beauty of its form should not be neglected. The music of its rhythm is an important factor in its power to please. The substance should be so studied as to bring out all its fascinating power and make it cultivate a love for everything beauti-

ful and sublime in the heavens above and the earth beneath, and for everything that is beautiful and sublime in human affections, aspirations, and deeds, for nothing else can do it so well.

Much of our imaginative prose literature can contribute much to the same end. It is also particularly rich in material that appeals to a sense of humor, and this has great value. Humor is akin to deep human sympathy, and is impossible without it. It reconciles us to the incurable ills of life, and lessens its sorrows. It weaves veils of beauty over life's ruins.

Committing to memory imaginative literature and great orations for elocutionary exercises gives them a stronger grip upon the emotions, and the delivery of them increases the effect.

Singing.—The most perfect and natural expression of feeling is singing. The Greeks depended upon it as the factor *par excellence* in emotional development. Religious and patriotic emotions awaken in no other way as they do at the voice of song, and the awakening is beautiful. While the teaching of musical technique in our schools is important, it is important chiefly as a means to an end. The great thing is to teach pupils to sing songs and hymns that are worth while both in the sentiments expressed and in the character of the music. The school must improve the public taste. Only that which is deepest and sweetest within us is fit for song, and only the purest and sweetest of music is fit to utter it.

Moral Emotions

History.—More than we have yet learned to appreciate, the substantial basis for proper motives of conduct and right living is the teaching of ethics and civics. Still the development of moral emotions cannot be mainly entrusted to these analytic studies. It depends more on the literary studies, including history. History presents us the virtues of men in the concrete, in the deeds and sacrifices of individuals and groups of men: deeds and sacrifices that express high thought, fiery zeal, and noble

devotion. The red life-blood of men is in them, so they have inspiring power.

> Whene'er a noble deed is wrought,
> Whene'er is spoke a noble thought,
> Our souls with glad surprise
> To higher levels rise.

So the biographies of history have an immense value aside from the fact that they explain the events of history. They are powerful agents in the forming of character.

General Literature.—Our dramas and lyric poems and all our great stories deal with the fundamental problems of life, with the primal and, therefore, great emotions of the soul. From these they take their interest. It is particularly for this reason that it is so necessary to create a strong appetite for reading and cultivate good literary taste and judgment. That which most stimulates feeling may most easily poison life.

Religious Emotions

Relation to Religious Institutions.—Religion furnishes the broadest and deepest foundation for moral principles, and the highest and most effective inspiration to noble living. The teaching of the religious tenets of the different churches is the peculiar duty of the churches themselves, and is entirely outside of the province of the public school. The latter, however, has no right to lessen the respect of its pupils for religion and religious institutions, but, on the contrary, is under solemn obligation to maintain it and increase it. For the children and society's sake it must supplement the efforts of religious organizations to spiritualize thought, feeling, and conduct.

Religion in Literature.—In respect to religious thought and feeling, the school can easily perform its function. The great facts and principles of religion have so permeated our living that they find expression in almost every phase of our literature. They are so woven into its warp and woof that they cannot be disentangled or ignored. If they could be, the remnants would be mainly a meaningless mass of rubbish. There is but one proper thing to do,

and that is to so teach them where they occur that pupils will learn to appreciate their value properly.

In a way, this indirect teaching of religion is more useful than formal religious instruction. The faith and hope and love and righteousness that has expressed itself in the lives of men and women has the warmth of life. It kindles the imagination and causes the heart to throb and thrill in response.

THE SCRIPTURES.—The sources of our basic religious and moral conceptions are the old Hebrew prophets, Jesus of Nazareth, and some of his apostles. Their utterances are now a part of the world's literature, and as such they demand a place in our course of study; and, because of their relation to our civilization, a very prominent place. The literature that has moulded a people's life is a part of its history.

The implications of this old literature that are developed in our modern church doctrines are not for the public school teacher to meddle with, but the great events so simply and beautifully told, the heroic lessons as the great teachers so bravely taught them to the men of their day, the hopes and aspirations which they cherished and expressed in teaching and song, these it is his business to teach. He must, however, be a broad-minded and large-hearted man to do it, or must have wise and learned guidance.

We cannot always suffer the incongruity of teaching in our schools the pagan literatures of Greece and Rome and keeping mute the greater literature of the Hebrew, for many of our pupils, those not reached by our churches, practically forever. For the deeper needs of life the book of Job is more important than the Iliad and the plays of Æschylus, and Paul's rhapsody on charity is worth many Greek love poems.

RELATION OF SINGING TO MORALS.—Singing is an art, but it is not merely an æsthetic performance. In singing, beauty and right are wedded. We sing to express feelings, but feelings connected with the great purposes of life. The old Greeks sang patriotic war songs when advancing to an attack and the singing gave momentum to the mass of men and put force into their blows. Many a man since

has sung himself into patriotic zeal which made it possible for him to lay down his life cheerfully for his country on the field of battle. So men sing themselves into religious enthusiasm, into faith and hope and love, into chivalrous loyalty to womanhood and home, and into courage to perform the great duties of life.

Volition

Cultivation of emotional feeling has a direct bearing on volition. It either prompts and gives character to action or hinders it. It is possible to develop a sickly sentimentalism or a tendency to excess of emotion. The former destroys the iron of manhood, and the latter renders it useless.

It is the business of the school to develop thought and feeling always with reference to doing things. That is one reason for the high value of industrial training and school athletics. They help pupils to realize the connection between knowing and doing. What they do now and what they plan to do in the future, they should do and plan with the highest motives.

So all good teaching increases the moral value of school work, and this is always great when the work is well done. The ability to work persistently at one lesson after another until a desired result is achieved, is akin to the character that carries great industrial and commercial enterprises to successful conclusion, or undauntedly contends for important social reforms.

CHAPTER IV

EXPRESSION

THE GENERAL STATEMENT OF THE LAW.—It is a primary physiological law that every sensor nerve excitation causes motor nerve reaction or tends so to do. In harmony with this we have many impulses, instincts, and appetites that prompt to activities that are the natural forms of their expression. So every feeling and emotion of the soul tends to produce some form of visible or audible expression. Our sorrows bow the head and cause the tears to flow, and our joys wreathe the face with smiles and make the air musical with laughter. So gestures and modified tones of voice and changes of countenance naturally result from changes in intensity and character of feeling. The normal function of ideas and thoughts also is to inhibit or to prompt and control action. Thoughts and feelings, therefore, are but conditions to action of a higher type. The ways in which they express themselves become the symbols of their existence, and in these forms of expression they become definite and complete, and reflexively enriched.

INDUSTRIAL EXPRESSION.—Our personalities express themselves variously. The cave or tent of the savage, his household utensils and implements of war and the chase, represent his mental effort to adapt himself to his environment that he may prolong his existence and secure his comfort in it. The same is true of the industrial products of higher types of life. The machines of modern factories, locomotives, steamships, palaces, and temples are thoughts expressed in wood, iron, and stone, the revelations of active mind. So a record of mind growth has been made by the race in its inventions and other material products.

ARTISTIC EXPRESSION.—Artistic designs in fabric, form, and color, buildings, statues, pictures, songs, and poems are expressions of thought that takes life in feeling, are artistic revelations of mind seeking to idealize its being, to verify its faith in its own high worth.

SCHOOL FORMS OF EXPRESSION.—The forms of expression available and to be developed in the schoolroom are gesture, voice, industrial making, modelling, painting, music, and oral and written language.

Among these, language is supreme. It is supreme because it has been the universal means of expression throughout the history of the race. By means of it men have recounted their deeds, and revealed their inmost souls in accounts of nature and of their religious conceptions, in the philosophies they have formulated and the poems they have sung.

It is supreme, however, not only because of its universality, but also because it is comprehensive in its scope. While other forms of expression are limited in their use, language may be the convenient and appropriate medium for the utterance of every phase of feeling and form of knowledge. In the schoolroom other modes of expression must necessarily be supplemental in their use.

VALUE OF EXPRESSION.—All the forms of expression demand culture, for two reasons. First, they are so many different ways in which to make known to others thoughts, feelings, and volitions. The mastery of each form is an additional power to make useful the mind's wealth. There is added to this a second reason not to be rated much lower in importance. Each mode of expression has reflex effects peculiar to itself. In its own way it tests knowledge and reveals its deficiencies; it stimulates effort to increase knowledge; it fixes attention upon one or another phase of knowledge and thus perfects it; it makes knowledge useful and remunerative, and this again inspires to more enthusiastic and strenuous effort both to acquire and use it.

EXPRESSION AS TEST AND STIMULUS.—It is surprising how limited and imperfect our knowledge of even familiar objects proves to be when we for the first time try to express it to others. If you have some skill in drawing and have never drawn a horse's head, you will find the effort to do so from memory embarrassing, and the result disappointing. It is remarkable how the different parts take wrong proportions, how the eyes and ears take wrong position, how the lines of the nostrils take improper shape.

Just as disappointing are likely to be the first efforts to describe the faces of our friends in their absence. The defects in knowledge thus revealed prompt to effort at correction, especially as they expose us to the criticism of others. We wish others to think well of us.

EXPRESSION AS A PERFECTER OF KNOWLEDGE.—From the character of the different forms of expression it is evident that reflex effects must vary both in kind and degree. A series of related facts, for instance, finds its best exposition through the medium of language, and the essay is, in consequence, unequalled as a means of cultivating the power to develop a subject logically; but no words can describe the shape of a continent or the outline of a leaf or a flower as definitely and clearly as the pencil may delineate it. So the use of the pencil better than the use of the word produces ability to note the outline shape of things and fix it clearly on the mind. Similarly colors and relief forms become distinct with efforts to paint and model. Music compels the heart to give deeper and richer response to noble thoughts and actions, and industrial making enables us to put our brains into our hands and feet, and to work with healthy good sense in sympathy with the great world of action.

EXPRESSION AS INSPIRATION.—So intimate is the connection between thought and feeling and their adequate expression that the thought and feeling born within the soul of man without finding utterance languishes and dies, and the power of volition is correspondingly weakened. A man realizes his market value also not in what he knows and feels, but in the things that he can do. His dignity lies in his power of accomplishing and achieving, and from it he receives the highest incentive to ambition. From childhood to old age the greatest happiness of life arises from making and doing. The boy's chief delight is in the sleds and boats he makes; the girl's, in the dolls she dresses. The orator draws his deepest inspiration from the audiences he sways with the power of his eloquence; the inventor, from the products of his genius as he sees them grow; the philosopher, from the system of thought he formulates for his fellows, and the philanthropist, from the deeds of kindness sacrificially done.

RELATION OF SELF-EXPRESSION TO INTERPRETATION.—With respect to expression the teacher has a double function to perform. He must train the pupils to express their own experiences correctly and elegantly, and also to interpret the expressed experiences of others. Very naturally, careful training in original expression is the best preparation for interpretation. The best map-maker, all other things being equal, is also the best map-reader. The oral interpretation of the language of others must follow the general law of expression. The deepest influence upon voice and gesture in reading must originate in understanding and feeling. When these are lacking, no art may utterly conceal the artificial character of the utterance.

CHAPTER V

THE CORRELATION OF STUDIES

THE FUNDAMENTAL PRINCIPLE.—Accepting the propositions that knowledge is creative activity and that mind and body both grow with normal exercise, it is easy to see that it is the business of the school to put the pupils to doing all that they can healthfully do within the scope of the school's functions and not to require them to do anything which they are not capable of doing at all or with profit to themselves and society. To endeavor to compel a child to do that for which he is not adapted is neither intelligent nor humane, defeats the true purposes of education, and is productive of very undesirable physical, intellectual, and moral results.

It is, therefore, a fundamental principle of education that every school exercise must be adapted to the capacity of the pupils, and that the progressive series of studies and other exercises must conform to the natural order of the development of their powers.

WEAKNESS OF OLD SYSTEMS.—Nearly all old systems of education failed radically in this that they attempted to impress upon the child's mind the knowledge considered necessary for the matured man to possess. Because the tastes, aptitudes, and instincts of the child were disregarded, his work consisted mainly in mechanically memorizing language that to him was meaningless and failed to satisfy the native appetites of his soul. The natural accompaniments of the attempt were the rod and the dunce cap, the memory of which still lingers with the elders of the present generation.

MODERN EDUCATION.—The modern teacher respects the capacities and instincts of child life and seeks to discover and satisfy them. His purpose is to teach the child as a child, always, however, with reference to the ideal possibilities of the future. The forms of manual activity introduced of late years into the school, the appeal to the

senses in nature study, the story and picture methods of presenting the phases of human life in which children are naturally interested, and the wiser grading of studies generally, have substituted the enthusiasm of the pupil for the rod of the teacher and smiles for tears. The sound of lamentation is now seldom heard in the schoolroom. Much remains to be changed, but a persistent, intelligent, and sympathetic study of child life will bring with it the necessary changes in due time.

PRIMARY PERIOD OF STUDY.—The detailed adaptation of school work to the capacities and needs of pupils is a matter of class-management and method, but a few general statements may be helpful. The strongest intellectual interests of a child's life are connected with appeals to his waking senses, demanding a presentative stage of instruction combined with recreations and the occupations and associations of the home. The most natural and educative activity of early child life is play. The play of children is stimulated by racial instincts, and the games are largely reproductive of race experience and prophetic of the serious occupations of the future. For these they are a preparation. Child love of field and forest is fundamental. It has its basis in pleasurable sense-excitement because, mainly, of the nomadic experience of a remote ancestry. The attention of children is of the type the psychologists usually term passive. It has reason for being only in present conditions, and lacks fixedness and persistence. It is superficial and objective, and but slowly yields to the subjective forces of life, purposes, and ideals. To this period belong the Kindergarten and the primary grades.

INTERMEDIATE AND ADVANCED PERIODS.—In the second stage of development, children have both the desire and the power to discover something of that which lies beyond the immediate horizon and below the outward surface. This may be termed the representative period. In this the imagination develops, and the book, with the help of picture and modelled form, becomes the chief instructor. Occupations begin to assume an industrial character, and pupils begin to plan for the future. Their thinking is still mainly a thinking in things, but romantic and idealizing tendencies mark the beginnings of abstract reason.

The intermediate period is followed by one in which matures a power of reflection and abstract reasoning. This is the High School period, the period of higher mathematics, of laboratory science, of literature, art, and philosophical questioning. This is the period also when the lower selfish interests yield to the ennobling devotions and enthusiasms of religion, society, art, and invention.

These stages of development demand a sequence of studies and a series of grades in each particular study. They are not exclusive. Each in some measure involves the other, and the mature student becomes, in a sense, a child again in each new field of study, and observation belongs as truly to the university as it does to the primary school.

THE CORRELATION OF STUDIES.—The subject of the relation of studies to one another is an important one, and it is as difficult as important. It has gained interest through the attempts of recent years to concentrate studies by grouping all about one or several core subjects. So prominent have these efforts been that the term correlation is frequently used as a synonym of concentration.

A true doctrine of correlation must be based upon a knowledge of the relating functions of mind and upon the relations of the things to be learned. A few fundamental principles may easily be established.

THE WORLD TO BE LEARNED.—The universe is a complex unity. Everything in it is related to everything else. Everything, therefore, however insignificant it may seem to be, is rich in relationships because of the vast number of different things that go to make up the universe or any considerable part of it.

Take an edible plant, for instance, or one that bears edible fruit. It is related to other plants, of course, because of resemblances in structure and processes of growth; but it is related also to the soil in which it grows, to the air which nourishes it, to the sunlight which makes it a living thing, paints green its leaves, and tints its flowers, to the insects that feed upon its honeyed sweets and distribute its pollen, to the birds and animals it helps to sustain, and to the human life it directly or indirectly

nourishes. This is not a complete list of its relationships, nor is any one of these single and simple. While the plant draws upon the air for part of its sustenance, it in turn purifies the air that sustains it. So also in its decay it enriches the soil that bore it.

A complete knowledge of the universe would consist of a knowledge of all its component parts in all their varied forms of relationship, an inconceivably vast number of facts marvellously coöperative. Such knowledge is possible to no one human mind nor to all minds together. At best we indeed know in part. *We, of necessity, select from the immense wealth of phenomena and relationships those that we expect to contribute most to our pleasure and profit.*

Analysis and Synthesis.—All knowledge is at once analytic and synthetic, discriminative and associative. Objects present themselves to the mind in larger or smaller masses. To the child they are vague and indefinite. They are separated into more or less distinct individual objects or groups of objects as the varied forms of attention develop, and these again group themselves anew according to the changing limitations of mental power or the varying purposes of mental activity. The analysis may be applied to larger units of attention, or confine itself to units infinitesimally small; and the synthesis may proceed from groups comparatively small to groups so vast as to overwhelm the mind with admiring awe.

Origin of the Sciences.—It is plain that the basis of clear knowledge is distinct analysis. If synthetic wholes are to be clear and definite, the component parts must certainly be so. Now analysis is specialized attention, and attention is mental activity more or less intensely concentrated upon some thing or things to the more or less complete neglect of others. In this the separate sciences have their origin. They are created by mind separating certain classes of objects or phenomena from other objects or phenomena with which they are in relation and relating them according to its own purpose. *The development of separate sciences is, therefore, based upon fundamental laws of mind, and is a necessary condition to the clearness and serviceability of knowledge.*

THE SAME OBJECT STUDIED IN DIFFERENT SCIENCES.—It naturally follows that all sciences are fragmentary, are contributory portions of comprehensive science, and that the same object may be studied in different ways and with reference to different forms of relationship. Plants, for illustration, may be studied as plants merely. That is, we may determine their various forms of relationship to one another with reference to their parts and functions and to the processes of their reproduction and growth, and so we have the science of botany.

But we may study plants also with reference to the distribution of their massed growth because of differences in soil and climate, and to their corresponding influence on the distribution and activities of animal and human life. They then become the object of a very different science, the science of geography.

The study of plant life, however, need not stop here. Because they modify the distributions and industries of human life, plants are determining factors in the development of social economies, factors in determining the destinies of communities and nations. When so considered, they belong to the domain of one of the noblest of all sciences, the domain of history.

SCIENCES DEPENDENT ON POINT OF VIEW.—It should be plain that the different forms of plant study depend partly on the extent of analysis, but fundamentally on the point of view. They are different in character. The geographical study of plants differs from the historical, and both differ from the botanical. In each science plants are placed in a different series of relationships, and the knowledge acquired in one series may contribute very little, if anything, to the knowledge demanded in another series, and must be practically ignored for the time being as an intruding factor that diverts attention from the purpose on hand. This truth applies in some way to all the sciences.

The statement, therefore, frequently made that geography is not a distinct science but a grouping together of parts of astronomy, geology, botany, and zoölogy is not strictly correct and very misleading. The mere fact that the study of rocks is part of the study of geography does

not introduce geology into geography as an essential part of it. The geographical study of rocks is one thing and the geologic study is another. It is only true that at times the study of a lesson in geography may be made simpler, plainer, and more interesting by supplementing it with a lesson in geology, and that the geology lesson may thus also acquire new light and interest.

Possible Concentration in Elementary Work.—Efforts at concentration of courses of study are due to a recognition of the close relationship of many forms of knowledge and a desire to simplify school work and economize time and energy. The elementary school furnishes the most favorable conditions for concentration.

Before entering school the child has acquired a vast and precious store of general knowledge involving the development of a large fund of primary ideas and a wealth of enthusiasms. This general knowledge is not systematized. It depends mainly on local relationships, on relations of time and place. The child groups things and events just as he happens to find them. He has but little capacity to note remote and involved resemblances and causes, the determining factors in systematic knowledge. The first years at school are, therefore, transitional. In them the child continues to increase the general and promiscuous knowledge of undisciplined mind and makes a beginning of systematic, scientific study. For him a fairly close concentration of studies is important. It is adapted to his type of mind and his needs. He needs to know a little about many things just as much as an older person needs to know much about a few things. It gives life and enthusiasm to his efforts, and is productive of maximum results with a minimum of effort.

The botanist passes from flower to flower, and in forms diverse discovers resemblances which escape the untrained eye, but the child naturally passes from the flower to the butterfly that feeds upon it or to the bee that loads its legs and wings with its pollen, and so its beautiful petals are invested with a new interest. Their number, too, in the symmetry of their arrangement and the number of the parts of butterfly and bee, take a livelier hold upon

his mind than the numbers of sticks and chalk marks presented only for counting, and are richer in meaning. These things give eloquence to his tongue and freedom to his pencil as other things cannot.

CONCENTRATION IN INTERMEDIATE AND ADVANCED WORK.—After the first four years at school such concentration as may obtain in the early grades becomes more and more irrational, inasmuch as the type of mind and the needs of life change, and the work of the school properly becomes each year more scientific. Maximum results are obtained by concentrating attention systematically upon definite series of facts and relationships. To accomplish special results the teacher finds it necessary to have special lessons and drills. To depend entirely, for instance, upon the written exercises of the different classes to teach spelling and penmanship, results either in making poor spellers and writers or in diverting too much thought from the more important function of gathering and organizing material to be written.

The fact remains, however, that all sciences should be treated as parts of a whole. When the teaching of parts of closely related sciences can be so arranged that they are made to supplement each other, the teacher violates fundamental laws of existence and mental activity when he fails so to arrange them, and robs the pupils of fruitful sources of intelligence and interest. He is guilty of the same offence whenever facts that are usually presented in one branch of study may give meaning and usefulness to the facts presented in another and are not by him employed to do so. Such an unnatural proceeding as the absolute divorce of related studies, as, for instance, grammar and rhetoric from literature, which sometimes takes place in the practice of schools, is a pedagogical crime.

FORMS OF EXPRESSION.—If it is wrong to teach grammar or any other science as if it were a thing separate and an end in itself, it is certainly wrong to teach drawing, modelling, painting, and composition in a similar manner. To study a bird until it becomes an object of intelligent interest and then draw and color a picture of an elephant or alligator that has not been studied, is a waste of

energy and a sad misuse of a useful art. It is equally foolish to have a pupil study a series of history lessons for a week or a month in order to gain useful and interesting knowledge, and then require him to write a composition on a subject about which he knows little or nothing. The first use of forms of expression in the school is to express the ideas and emotions developed there. That is a means of developing clearness of knowledge and intensity of feeling. Such use of it gives meaning and enthusiasm to expressive activity.

CHAPTER VI

INTEREST

PROMPTINGS TO ACTION.—Inasmuch as a vital condition of growth is well-directed activity, the means, or methods, of occasioning activity challenge consideration. A man, that means a child too, is naturally active, because he is alive. Activity is a primary law of life, an essential mode of its manifestation.

Our activities are of fairly well-defined types. Some are spontaneous, some are definite but simple reflex motor reactions, others are prompted by appetites and instincts, while still others are voluntary. The first activities of life are not voluntary, and of the non-voluntary activities the most interesting to the teacher are those prompted by appetites and instincts.

APPETITES AND INSTINCTS.—Appetites are the revelation in feeling of the needs of life. They are urgent. Hunger and thirst, for instance, always stand as types of intense desire. The human appetites are numerous, and are by no means all physical. The mind has its hungers and thirsts as well as the body.

Instincts, as observed in animals, involve two elements, —the impulse to perform acts that accomplish certain definite results without foresight of them, and the ability to perform them without previous training. These instincts are subject to certain laws. They appear at regular periods as the body in its natural growth reaches maturity in the different phases of its structure; they fade away when occasion for their exercise does not present itself at the proper time; and they are inhibited by the substitution of other lines of activity.

HUMAN INSTINCTS.—It is somewhat natural to assume that instincts are confined to animal life. That is the case because they manifest themselves in human life under different conditions, and, therefore, so modified that they may escape detection; but a child begins to walk very

much as a swallow begins to fly. Neither learns its mode of locomotion. A swallow remains in its nest and grows until its structure is adapted to flight, then it flies. Anxious parents try to teach the little child to walk, often weeks before it is ready, and they are much disappointed because it gives so little response to their efforts. It seems to attend neither to the walking of those around it, nor to the efforts made to teach it. One day to the surprise of those who lovingly watch it, it rises to its feet and walks. It walks for the same reason that the swallow flies. Countless generations of its ancestors have done it, and have bequeathed to it a body adapted to the business after a normal maturity of growth has been reached. The child is impelled to begin to talk and do many other things in the same way. The fact is that the greater complexity of structure and of racial heritage makes man richer in instincts than any animal.

Nature and Origin of Instincts.—Instincts, to use the words of Prof. James, are the "functional correlates of structure." They are the results of racial experience, the product of centuries of effort. They are registered in the whole structure of the body, but especially in the lower centres of the nervous system, ingrained, as it were, in the very fibres of being. They demand the teacher's respect, because they are primary springs of action, and they command him to study child life sympathetically in order that he may discover them and turn them to proper account.

A help to the discovery of the instincts of children will be found in the question, "What has the race been doing?" or, more particularly, "What did the race do in the early stages of its development?" Then its basic instincts were formed.

Primitive Human Activity.—Influenced by ties of blood and other conditions, primitive men lived in communities. They built shelters for themselves, and made implements of peace and war. They were afraid in the dark, because of wild animals, human foes, or imagined terrible monsters that might fall upon them unawares. They were also afraid or, at least, suspicious of strangers as possible enemies, and of any new phenomena. They

hunted and fished for a living through periods of untold length, and migrated from one hunting or fishing ground to another. In their migrations they always sought water and wood or grass, in other words, the romantic spots in nature. Imperfectly sheltered and dependent on natural supplies of food, they were much interested in changes of climate and weather and other natural phenomena affecting food supplies and bodily comfort. They did much fighting. Among primitive people, nearly the world over, fighting is the correlate of living. Either as tribes or as individuals they acquired property and learned to claim rights, to both of which they desperately clung. Through all this they learned to resent injuries and encroachments with anger and hate, to aid their associates in danger, sickness, and distress, to imitate their elders and leaders in ways of doing things, to vie with one another for superiority and leadership in war and the chase, to be curious with respect to objects around them as possible sources of danger or comfort, to love things beautiful in nature and things ornamental to themselves, to be religious, and, after a long time, to be modest. They also learned to play, for before the serious pursuits of life are entered upon or in periods of cessation, when the increase of vitality impels to action, the imitation and repetition of these pursuits become sources of the greatest pleasure.

INSTINCTS OF CHILDREN.—Naturally the leading instincts of children, as observation proves, are sociability, involving sympathy, fear, anger, imitativeness, fondness for play, constructiveness, curiosity, acquisitiveness, emulation, æsthetic sensibility, fondness for the woods and water, often leading to truancy, delight in adventure, enjoyment of fighting, religiousness, and modesty.

DIFFERENCES BETWEEN HUMAN AND ANIMAL INSTINCTS.—(*a*) Between some animal and the corresponding human instincts there are marked and significant differences. Animal instincts, in the first place, are connected with tolerably fixed modes of motor reaction. This is not the case with all human instincts. The robin's instinct, for example, impels it to build a nest, and always a robin nest. Robin nests have been remarkably similar

for innumerable generations. It is different with men. Possibly if they had always lived in wigwams, their children, when the building instinct wakens in them, might accurately construct wigwams without instruction, but they do not. They begin building instinctively, but they build partly in imitation of what they have seen, partly as the material at hand permits, and largely in expression of notable inventive faculty. The varied experiences of the race have made this characteristic of many human instincts, they prompt to kinds of activity, but do not determine the details of action.

(*b*) The child repeats the culture periods of the race not in mechanical details, but in instincts; therefore, also, because of the mental life which separates him from the animal, in his intellectual pleasures and enthusiasms. With animals, instincts unexercised fade away; but with human beings, if the conditions for their exercise are entirely lacking, they yet, as they appear one after another, condition the child's appreciation of the things to which they pertain. How the boy, when the old fighting spirit of the race asserts itself in him, enjoys the recitals of battles and heroic deeds! How in time he delights in the myths and legends of a long ago past! And how, when the proper time comes, he develops a passion for woods and ponds and streams! To what noble uses may we not turn these things?

(*c*) There is still another difference of much importance. In animals instincts once exercised survive as instincts; in men they are but the beginnings of action. They disappear as instincts. They are swallowed up in the richer life of volitional activity guided by imagination and thought that may assume an ever-widening range. So the instinctive splashing in the pond, or climbing the tree, or chasing the squirrel and rabbit, may be made the beginning of high scientific or artistic achievement; the joy of reading accounts of perils and battles, the beginning of great historical learning and noble citizenship; and the building of miniature walls of mud and towers of stone, first lessons in the art of erecting stately mansions and grand cathedrals.

Beginning of Voluntary Activity.—The first bus-

iness of the teacher is to convert the rich and varied forms of non-voluntary activity of mind and body into the still richer and more varied forms of activity that are well-directed. Now volition has its beginning in attention, and attention cannot be created in the abstract. It has its genesis in harmony with law. Generally speaking, all normal activity of mind and body, that is, activity of mind that promotes their healthful development, is a source of pleasure. The same is true of normal rest, which is as necessary to the well-being of both as action is. Both abnormal activity and abnormal inertness are, on the contrary, unpleasant or even intensely painful. Both pleasant and unpleasant experiences occasion a tendency to concentrated mental action, a tendency to attention. The feeling that prompts attention, or that is a revelation in consciousness of the tendency to attention, we call *interest.*

Relation of Interest to Appetites and Instincts.—The elements of the doctrine of primary interests must be sought in appetites and instincts. These prompt to the activities that the whole past of the race has decreed to be vital for us, therefore normal. If we take advantage of all of them, we create interests that are rich and varied, many-sided. If we neglect or prevent the exercise of any one of them at the proper time, we cause the atrophy of one phase of being, destroy one source of action, and so far impoverish life in its growth.

The Multiplication of Interests.—Numerous as are the initial interests of life because of the variety of its appetites and instincts, their number is insignificant as compared with those to which they lead, because human instinctive acts are so lacking in fixedness and the human mind is so capable of memory, imagination, and thought. The pleasure of performance lingering in memory stimulates to further activity, and imagination and thought may vary the activity almost indefinitely, thus creating ever new interests, new incentives to action.

Resources of Civilization.—How ready civilization is to supplement men's inventiveness! In every line of action it has added achievements to achievements. It places the wealth of them accumulated through the cen-

turies at the disposal of the teacher. By taking advantage of the pupil's natural likes, he may lead the young enthusiast to find a hundred sources of knowledge, action, and pleasure where his ancestors could find but one, and to discover relationships to them never revealed. Thus curiosity, which is at first purely instinctive, grows into a desire for larger knowledge of fact, and may become an ardent passion for the discovery of truth, and that is the noblest of all incentives to intellectual effort and accomplishment.

ADDED INCENTIVES.—One instinct may supplement another, as emulation supplements curiosity; but more than this, with each effort well made, new series of incentives rise. There comes with it first of all a sense of mastery, which is a valuable stimulus, and the happiness that arises from the approval of teachers and parents. With widening experiences there is an enlargement of the sense of the usefulness of knowledge and power, and an increased ability to anticipate desirable results with their accompaniments of applause and comfort. Through varied experience there is gradually developed a fixed purpose in life, the ability to drudge with patience, to persevere through toil and sacrifice, a superiority to failures and disappointments, and the interest begotten of present pleasure becomes the interest of remote hope. Then, if the ends sought are high, life is noble. Thus instinctive interests lead to transient ambitions, and transient ambitions father one that is persistent and supreme, sovereign.

THE TEACHER'S PERSONALITY.—No theory, however, of the natural growth of interests must overlook the personal influence of the teacher. Purpose and determination come to children but slowly. Frequently the teacher must supply both for them in order to hold them to their best work. Without this the enthusiasms of the moment often languish and die. Always the force and energy and enthusiasm of the teacher are important, because force, energy, and enthusiasm are communicable. The life and fervor of one may become the life and fervor of many.

CHAPTER VII

SCHOOL EXERCISES

GENERAL LAW.—Every school exercise should be economical of time and energy. It should contribute as much as possible to the attainment of both the immediate and ultimate ends of education. It should do this specifically and definitely. Of all teaching aimless teaching is the most hopeless. Each exercise should be a purposeful factor in the day's work; each day's work, a component part of a well-planned week's work, and that, a necessary part of the year's work.

This does not require a mechanically rigid programme. In fact, a mechanically rigid programme cannot succeed, for the results are not to be measured by chapters or pages of books, but by units of efficiency of bone and muscle and brain. It is, therefore, important to know the forms, functions, and limitations of school exercises.

THE EXERCISES.—Aside from discipline and occasional incidental acts, in all school exercises the work of the teacher assumes the form of Instruction, Drill, or Test. It is nearly always the case that these processes are represented together whenever a class is active, whether it be in a grammar recitation or in a period of gymnastic or manual training. Sometimes, however, a period may be devoted chiefly or entirely to instruction; at others, to a series of drills; and at others, to testing the ability or achievements of pupils

Instruction

Instruction is the art of so stimulating the minds of others to action and so directing their activity as to give them desirable results in knowledge, together with increased power to acquire knowledge.

There are different ways in which this may be done. Pupils may be brought into direct contact with the object they are to know, or indirectly into contact with it by

means of pictures and other forms of objective representation. These may be termed the Direct and Indirect Objective methods. Or they may be led to think about it by means of questions, or be given information concerning it by statement or lecture. The former of these is called the Question, or Socratic, method of instruction, and the latter, the Telling, or Lecture, method.

THE DIRECT OBJECTIVE METHOD.—By the direct objective method the mind is either led to gain sense knowledge of material objects, as in Geography or Botany, or to give attention to its own changing acts and states, as in Psychology. This is the method of observation and experiment. It is the method that must be employed for the development of basic ideas. In such work there can be no substitute for it. This is as true of the highest class in the university as of the lowest group in the Kindergarten.

Our first knowledge of blue must come to us by seeing things that are blue, and it never comes to us if we are so unfortunate as to lack the sense of sight, nor then does the knowledge of any other color.

We get our first knowledge of water by seeing it in a glass or pond or stream, by feeling it as we splash it or are bathed with it, by tasting it as we drink, by hearing it as it tumbles over a cliff or ripples over rocks and pebbles.

This simple truth with its numerous applications we constantly forget in teaching, and yet, for the majority of people, knowledge so acquired is the most vivid and real of all they have, and, for all of us, knowledge to remain sane and useful must be deeply rooted in objective reality.

The more extensive, therefore, the range of this observational and experimental knowledge is, the better, provided always that it is made, as it should be, the basis of the proper abstraction and generalization. Otherwise it lumbers the mind; it binds the wings of thought.

THE INDIRECT OBJECTIVE METHOD.—If it is true that basic ideas must be developed by the objective method, it is just as true that all knowledge that may be so imparted can be imparted thus more vividly than in any other way. Nothing can help us to know London or Paris or the

Rocky Mountains so well as London or Paris or the Rocky Mountains themselves. But the learner may not always be able to see these or many other objects with which he should become acquainted, so the teacher must often find the best possible substitute for actual sight or even prepare for it that it may be as profitable as possible.

This substitute is found in illustrations, as on charts, or in pictures projected on a screen with a stereopticon, or shown through a stereoscope, or displayed on loose cards or in books; in plain and relief maps; in prepared specimens, or in carefully-made models.

THE QUESTION METHOD.—The immediate results of observation are ideas of particular phenomena, percepts and primary data of consciousness. By means of the imagination aided with illustrations, knowledge of this sort may be vastly increased; but the mind does not stop with that. Out of the material so acquired, it elaborates other products distinctly different in character. It forms concepts and corrects and enriches them by performing acts of judgment and reason.

These are methods of determining relationships. In judgment, the relationship of objects of thought to each other is determined by direct comparison. In reasoning, it is done by indirect comparison. The relationship of two objects of thought in the latter process is arrived at by means of the relation of both to a third. The best way to aid the mind in the performance of these functions is to ask proper questions.

QUESTION HELPS TO JUDGMENT.—It is evident that if knowledge is to be acquired by comparison, the things to be compared must be clearly in mind and the attention fixed on those features of them that make the comparison effective. If they have been or are within the learner's range of observation or other form of experience, the way above all others to bring them into clear comparison is to employ a question or series of questions, and another question or two may so direct attention as to flash the relationship vividly upon the mind as a surprising and delightful revelation.

A simple "What is this?" unless merely the name of the thing is wanted, is worth much more than the state-

ment, " This is the wing of a bat," or " This is a beaver's tooth." A statement about a thing with which the learner thinks himself familiar is apt to be accepted as a matter of course, and, therefore, leaves the mind inert; but a question naturally challenges his mind to action. How instructive it may become, every teacher knows.

MENTAL INERTNESS.—The question is valuable because of the strong tendency to form habit. It is much easier to repeat old acts than to perform new ones. The resulting slovenliness of ordinary perception and thinking is remarkable. Of the many people, for instance, who see bean stalks grow every spring, comparatively few notice any peculiarity in the first leaves that appear. Show a young bean stalk with two or three pairs of leaves to a class of boys and girls, ask whether the pairs are alike, and immediately there will be clear in their minds what years of ordinary experience might leave unnoted. Now open a bean, display the parts within the envelope without tearing them apart, ask whether any of them resemble parts of the growing plant, and again a truth will be revealed that will lead to the discovery of many more.

QUESTION AID TO REASONING.—In reasoning, the conclusion results, as stated before, from the comparison of two objects of thought with each other by means of their relation to a third. That the process may be successful, the objects must be clearly in mind and the comparisons must be definitely made from the same standpoint. To bring this about, questions may be employed to advantage wherever the pupil fails to fulfil the conditions.

THE TEACHING OF SOCRATES.—The question method has become famous in history through the teaching of Socrates. He employed it in the realm of morals and social economy. He employed series of questions in two ways. He was a quick, keen reasoner. When he found a man who entertained a wrong conception, he was able at once to recognize the man's point of view and to lead him with skilful questions to arrange facts in the relationship they must necessarily assume if his way of thinking was to be carried out consistently. Thus he led him step by step until the logical conclusion dawned upon the man and revealed to him the incorrectness of his position. This

enabled him to work out the true for himself. Socrates called this ironical questioning.

In a similar way he led people with vague and unformed opinions to grasp facts clearly in their proper relation until they were in position to formulate correct conclusions. The questions with which he did this, he called maieutic, birth-giving.

VALUE AND LAWS OF SOCRATIC METHOD.—The question well put arouses interest, directs attention, and so guides the mental processes that ideas are clarified, modified, and rearranged. It is the method, excelling all others, to lead learners to form correct generalizations based on the facts within the range of personal experience and to work out the correct solution of mathematical and other problems whose facts and conditions are presented but not properly understood.

To employ the method successfully the teacher must know definitely what he wishes to accomplish; he must know well the mental resources and capability of the learner; he must thoroughly understand his subject; and he must know the nature and order of the processes by which the desired knowledge may be acquired.

THE TELLING OR LECTURE METHOD.—The teacher was originally a reciter, a narrator of the deeds of a man or a people. That early teacher was effective, for he recited things closely akin to the experiences and passions of his hearers, and he had voice, facial expression, and gesture to help him. These give life to statement and make lessons charming. So the teacher will always be to some extent a reciter, but not altogether; for while telling is the most natural and seductive form of teaching, it is also the most wasteful. As with the seeds of forest trees, much is scattered, but little takes root.

THE TEACHER A DRILL-MASTER AND EXPOUNDER.—To avoid loss, the teacher early learned to have his pupils repeat his lessons after him time and again, and so he became a drill-master as well as a reciter. When books became cheap enough, the book largely took his place in the latter office. Then he became mainly a drill-master and expounder, and as an expounder he has slowly and pain-

fully learned much about teaching that his ancient predecessor never knew.

THE BOOK VERSUS TELLING.—More and more oral telling must yield to the book, because the book presentation can usually be made more systematic, accurate, and elegant, and it is permanent. Its study can be interrupted, resumed, and repeated at will. If an oral lesson is to be studied as carefuly as that of a book, it must first be taken down in writing, entailing an unfortunate loss of time.

In primary work teaching by word of mouth takes precedence, because pupils have not yet learned to use a book, because of the life and energy the telling gives the lessons, and because the living teacher can adapt himself to the changing needs of immature minds as the dead book cannot.

In more advanced grades the teacher becomes the assistant of the book. He supplements it—first, by preparing the pupils for its study with proper directions and explanations when he assigns the daily lessons; and secondly, by properly conducting the recitation, employing question and illustration, explanation and additional statement, as may be necessary to make the lesson thorough and complete.

Thus, in fact, all the methods are supplementary, none of them complete alone. Question and statement direct observation and reason, and observation and reason give value to statement and question.

CHAPTER VIII

SCHOOL EXERCISES (Continued)

Testing

In discussion, testing may be separated from instruction and drill as it may not in practice. In practice, it must go before them, come after them, and, generally, with them step by step. It is the means of determining what has been done, what can and is to be done, and how it may be done. It is the guide to giving every piece of school work the highest degree of effectiveness, in other words, the guide to economy of time and effort, both of which are very valuable in so important a business as the development of knowledge and life.

Tests of Power and Skill.—The tests of power and skill are in their exercise. In all forms of physical activity these are easy. The doing of a thing is undoubted proof of the power to do, and the degree of skill is evident in the ease, rapidity, and accuracy of the doing. The testing of mental power and skill is not always so easy a matter. The very ease and accuracy with which an exercise is performed may be sufficient cause for suspicion. It may indicate that the pupil lacks either the ability or the willingness to do the work. It is much easier, for instance, to copy a good essay than to write an acceptable original one. So the mere fact that a pupil can readily state the correct analysis of a sentence or the proper solution of a problem is by no means necessarily a proof that he can analyze the one or solve the other. He may get some one else to do the work and then commit the statement to memory. His reproduction is then merely evidence of ability to memorize mechanically and of the possession of an unfortunate tendency to dishonesty, as he presents as his own and for his credit, work that has been done by another.

Aids to Satisfactory Tests of Mental Power.—It is very important from a moral as well as from an

intellectual standpoint that the tests of mental power be effective. Good teaching helps to make the ordinary tests satisfactory by leading the pupils to be successful and enthusiastic in their work, and thus honest in their efforts to overcome difficulties. Appeals to the moral sense and dignity of the pupils contribute to the same end. A third resource is found in requiring intelligent explanation of every step in the work done. This tends to reduce the value of mechanical preparation and urges pupils to seek forms of assistance that are really beneficial.

SUPPLEMENTARY TESTS.—It is easy to supplement the recitation of lessons prepared beforehand by requiring similar work of the class without giving opportunity for such preparation. This should be done frequently. In arithmetic, problems may be added in the classroom to those previously assigned for study, or a new set of problems may sometimes be substituted for them. Such problems, of course, should involve the same principles as do those in the regular lesson.

A class studying Cæsar may at times, while reading one book, be asked to work out under the teacher's eye a passage selected from another not previously studied, as all the books closely resemble one another both in style and vocabulary. In such an exercise the teacher must within the limits of good judgment take the place of the dictionary and notes. It is a pity that such tests of ability to work out a Latin lesson are not more frequently employed, as the ease with which translations of Latin authors can be either bought or borrowed so commonly tempts pupils to substitute the committing of translations for the study of Latin.

In the botany class a new plant analyzed and identified, with the help of a key in the presence of the teacher, may similarly be worth much more than many dried plants in a herbarium with the written descriptions attached. It is always possible to beg the specimen and copy the description.

TESTING KNOWLEDGE.—The knowledge of others is revealed to us by its expression. It is something we never can directly know. It is, therefore, easy to over- or underestimate it, or even misapprehend it altogether.

The forms of its expression group themselves into three classes: 1, conventional symbols, as words and signs like those used in mathematics; 2, tones of voice, pose, facial expression, and gesture; 3, various forms of making, as in the arts and industries. It is mainly in dealing with the first that the teacher finds his difficulties. He meets them in the recitation.

A Useful Rule.—Whatever method of conducting a recitation may be employed, it is well to accept as fundamental law the proposition that statements made in the exact language of the book are ground for suspicion, that the pupil who so makes them does not well know or understand that of which he speaks. This law applies particularly to the making of long and continuous statements and to pupils who habitually prepare lessons for word-by-word reproduction.

There are two principal reasons for this. In the first place, to memorize a whole lesson word for word requires such a protracted concentration of attention upon the language itself that there is little time or power of attention left for anything else. In the second place, every person uses a vocabulary and style of language that are in many respects peculiar to himself. It is a part, as it were, of his personality. When a pupil, therefore, studies so as to develop ideas and thoughts of his own, so as to assimilate what he studies, his mind naturally fashions for his acquisitions characteristic forms of expression. It is not natural for an immature person to use the vocabulary and style of a mature and cultured person.

The Question Method.—There are two distinct methods of conducting a recitation test,—the question method and the topical. They accomplish different purposes and are supplementary. Test questions are prepared either for a group of pupils or for an individual. In either case they are so important that to be skilful in their use is to show mastery of one of the fine arts of teaching.

Preparing to Test a Class.—No one may properly test the preparation which a group of pupils has made of a lesson, without carefully preparing himself for the test. He must begin this preparation by gaining or regaining a complete mastery of the subject-matter of the lesson

and of the author's presentation of it. There is a wide difference between the two, and the mastery of both is absolutely necessary.

Then he must clearly fix the perspective of the lesson from his own point of view, so as to be in position to make the day's work harmonize with what the class has done and is expected to do. He must determine what are the principal facts to be taught, and what the subordinate, and group them in the order of their relationship.

Then he must determine the order in which to develop the lesson. Sometimes he can be more sure of lively interest and effective work if he begins at the end or climax of the lesson and works systematically backward from that. Sometimes he can do better if he begins in the beginning and works forward; and sometimes, if he begins in the middle and works both ways. Experience must teach which order of procedure is best in any particular case. If there is no other reason for changing the order, variety alone is sufficient, because monotony is destructive of interest.

One thing more is necessary. His knowledge of his pupils should make it possible to predict with relative certainty what each will get out of the study of the lesson, and so to plan what questions to put to the different members of the class and what else to do for them, to give the recitation the highest possible value for each one. No list of questions, however, can be mechanically adhered to. The teacher must be ready to meet every changing phase of mind, every change of circumstance and condition.

QUESTIONING THE CLASS.—When at last the time has come, the teacher puts the questions one after another in the order necessary to accomplish his purpose. If he is skilful, the minds of all the pupils will alertly respond to all the questions and endeavor to formulate proper answers to them. Their facial expressions and bodily movements will indicate the success or failure of their efforts. If the teacher is quick of perception, he can tell at a glance which pupils can give intelligent answers, or think they can, which cannot answer at all, and which are suffering various degrees of perplexity. His previous

knowledge of the pupils aids him in this. Having measured the class with his eye, he knows of what individual pupil or pupils to demand the oral answer. These should most frequently be not the ones who may be expected to answer well, but one or more of the others; for they need the teacher's help either in the way of compulsion to more effort, in the way of encouragement, or in the form of explanation or suggestive statement or question. The answers or failures to answer, and the manner of the pupils, must guide the teacher in his choice of means. These suggestions must not be so unthinkingly followed as to occasion the neglect of those usually well prepared. For a number of sound reasons which should easily suggest themselves, every pupil should at all times feel that he may be the one called upon to give oral answer to the question stated by the teacher.

Poor Question Methods.—The poorest use of a test question is to put it to a class for a concert answer. Only mechanical answers can be given successfully in concert, and even then, the giving is almost sure to conceal a surprisingly large amount of ignorance.

Some teachers habitually develop the lessons in recitation strictly following the order of the book. This naturally encourages mechanical preparation. The teachers who employ this method frequently use prepared lists of questions printed with the lessons, and sometimes make matters worse by putting these questions in a regular order beginning at a fixed place in the class. Pupils are thus enabled to predict with tolerable accuracy what questions they will be called upon to answer, and are tempted to prepare their lessons accordingly. Teachers question in this way partly for the purpose of insuring equitable distribution of the work, and partly to enable them to grade the pupils more accurately for the work done. The method, however, even with its best modifications, is wrong in principle and belongs to a very mechanical and poor system of teaching.

Individual Question Tests.—To test accurately the capacity, acquirements, and statements of individual pupils, requires the highest skill of all. When a pupil blunders in mathematics, his teacher must be a master

of mathematical logic, accurate in noting quantities and the stated conditions of relationship, and familiar with the processes of that pupil's mind, in order to discover quickly where the pupil has gone astray in his efforts; and he must be skilful in the forming of questions that will bring to him the proof of the correctness or failure of his judgment, and to the pupil a revelation of the nature of his mistake without at the same time correcting it.

In other branches this is frequently more difficult than in mathematics, because a statement mechanically committed to memory, and consequently made in ignorance of its content, is as correct in form as one intelligently made, and most likely more so. It is all the more deceptive if made in writing. Many an excellent, written answer conceals ignorance from an inexperienced teacher, and not infrequently from an experienced one as well. When an answer is oral, the face and voice generally indicate the value of the statement. When it is meaningless, there is a certain blankness of expression of countenance, a very noticeable lack of lustre in the eye, and a lack of animation in the voice. When the statement carries but partial meaning or a misinterpretation, the emphasis and inflections are sure to be faulty. Always the use of unaccustomed words should challenge question. But the causes for suspecting deficiencies of knowledge are so numerous and varied that it is not possible to lay down specific rules for their discovery. Experience and quick wit must take the place of rule

THE TOPICAL METHOD.—It is easily seen that the question directs attention to particular points in a lesson, and is, therefore, the means above others to concentrate thought and to make knowledge accurate and thorough. To gather together the parts of a lesson or series of lessons and bind them into a compact and logical unity is the function of the topical method of recitation. It trains the learner to assemble the fragments of knowledge, arrange them in an orderly manner under the guidance of leading ideas, and give them fitting expression in continued, organized, and polished discourse.

The topical recitation, therefore, either follows the questions as the means of summing up what has been

acquired; or it precedes, and the questions follow to test every part and point of the statement.

THE EXAMINATION.—The examination is a review for test purposes. In spite of the abuses to which it is subjected, this is one of the most important of school exercises. It is as necessary for the teacher as for the pupil. Even the most skilful teacher over and over again finds himself deceived into thinking that he has accomplished what he has not. The examination is the corrective of such errors. It enables him to take his bearings and plan his work anew.

Examinations should follow every series of lessons that form a group more or less complete in itself. They may be conducted either by the topical or question methods, or by a combination of both. As in the recitation, oral work allows the greater freedom and insures the higher degree of accuracy, while written work economizes time, trains to systematic expression, and develops a peculiar mastery of finish and accuracy of language.

CHAPTER IX

THE DRILL

General Statement.—Drill is directed and inspired repetition. It is necessary to complete instruction and make it effective. No other phase of his work demands of the teacher more animation, patience, and diligence, or the exercise of better judgment. Without the drill the best instruction may be dissipated so that no tangible result of it can ever again be discovered; and yet with it, the most enthusiastic pupil in a school may be deadened to all the higher interests of school life.

Results of Repetition.—In order that drill may be successful it must be subject to certain laws. What these are, a study of the natural results of repetition makes apparent.

First, it is a fundamental law of our being that when an act, whether mental or physical, has once been performed, a second performance of it is easier, and generally, more accurate. The reason for this seems to be that for the performance there must be active change and adjustment in the nerve tissue, and, if the act is physical, an adjustment of bone and muscle as well. These changes and adjustments modify structure more or less permanently. The more frequently acts are repeated, especially if carefully so, the more thorough and lasting are the modifications of structure, and the easier and more accurate become the repetitions. Ease and accuracy are both indicated by the term skill.

Other results are involved in this. Not only are the acts more easily and accurately repeated, but these particular kinds of performance tend more and more to become the fixed and invariable forms of reaction upon the stimuli that have prompted them, or even upon other stimuli of the same class. This fixedness of form of reaction is what we term habit, and habit is either a most useful servant or a jealous and inflexible master. Which

it shall be depends on whether it is a correct one and properly subordinated to the purposes of a sound education, or whether it is a perverted one and mechanically made the supreme end of educational effort. In the latter case it produces two disastrous results; it lessens active attention to what is done, and it confines the range of interest to very narrow limits. It is only as habit frees the mind from the necessity of exhausting its energies in attention to processes that should be mechanical and, therefore, nearly or quite unconscious of performance, that it may contribute to alertness in the discovery of new sources of interest and preserve the vigor and possibility of mental growth.

The drill also increases power. We all know that we become stronger to do by what we do. The increase is made greater by the confidence that grows with skill in doing things.

Still another desirable result of repetition is increase in the clearness, depth, and breadth of knowledge. This is very natural. Knowledge imparted by others must be mediated through various forms of expression largely peculiar to the person who uses them. In consequence, much of the learner's attention is diverted to the forms of expression themselves and lost as far as the thought of the author is concerned. Each repetition is likely to lessen this loss. Then again, things are rich in meaning because of numerous elements and relationships. In a lesson, some of these are clearly stated, while others are implied or incidentally suggested. Of these latter, some are grasped at the first effort to master the lesson, while others escape attention. With each repetition the number of those unnoted is apt to be less. Then again, there frequently is a considerable interval of time between the repetitions, and in the interval the mind has grown in power and experience, and so can enrich the old with wealth newly acquired. How old facts get new meanings with the flight of years!

Another result of repetition must be added to the list. It tends to make knowledge a lasting possession. A statement once heard or read and an object once seen, no matter how great a source of interest at the time, may

soon be forgotten. With each review of the experience, the likelihood of the loss of the knowledge of it becomes less, and its availability for use becomes greater.

COMPLETED DEFINITION.—To sum up what has been stated, drill may be defined as directed repetition having for its purposes the development of such habits and skill as are needed to make instruction effective, the incidental increase of knowledge and power, and the establishment of permanence of the knowledge acquired.

PRINCIPLES TO BE OBSERVED.—The first principle is evident from the nature of skill and habit. Wrong or imperfect acts repeated frequently become as easy of new repetition and as fixed in habit as proper and correct ones. It is, therefore, of primary importance that in all drill exercises pupils should be inspired and guided by the highest possible ideals and should be carefully instructed and directed in the correct methods of doing things.

A second principle depends on the distinction between mechanical and logical processes. Mechanical skill is secured by frequent exact repetitions of the *same* processes, while logical skill results from frequent performance of *similar* processes, that is, processes which deal with different facts, but governed by the same principles of relationship.

To apply the principle well, it is very necessary to distinguish clearly the two kinds of processes and understand their relation to each other. Inability to do this leads to the commonest and most hurtful of pedagogical crimes; for it certainly is nothing less than crime to make mechanical, processes that should be logical; and almost as much so, to fail to train pupils to the degree of mechanical skill needed for the practical activities of life.

In mathematics the difference between the two is easily observed. We form the concept four, for instance, by performing certain thought processes with reference to things perceived. The concept becomes clear and definite by performing the processes with different kinds of objects, thus making the processes *similar* but not the *same*. Now the figure 4 and the name four are symbols arbitrarily agreed upon, and they get their value from mechanical association fixed by repetition. Thus we be-

come skilful in writing $2 + 2 = 4$ or $2 \times 2 = 4$ by doing the operation over and over again; and it is unfortunately true that it is possible to become skilful with the operation $2 \times 2 = 4$ without having the remotest idea of the thought values which it is supposed to represent. So it is possible to commit to memory the statement of the demonstration of a theorem in geometry, which by itself has no theoretic value whatever and is generally just as destitute of practical value, while the geometric quantities indicated are entirely unnoticed and their relations absolutely undiscovered. Frequent repetition may fix the meaningless demonstration, but only the consideration of the quantities themselves can bring the discovery of their value and relationship by a flash of insight, and that is valuable and inspiring.

What is true of figures in arithmetic, is true of words and idiomatic phrases in language, lines and shades in drawing, letters in penmanship, notes in music, and dates in history. Skill in the use of these comes only by frequent repetition, but no repetitions of them can give revelation of the truth and beauty which they should represent. Logical processes alone can give that. Skill in the use of symbols gives practical use to thoughts and feelings, but thoughts and feelings give life and meaning to symbols.

So we have as a third vital principle of drill, never to make what should be a thought process a mechanical one.

Another principle is important. The intensity of interest and the consequent degree of attention with which an act of mind or body is performed deepens the impression it makes. It increases the likelihood of retention, and lessens the number of repetitions necessary to insure the desirable degree of skill in its reproduction.

There is that in the discovery of artistic values and logical relationships which itself awakens enthusiasm, but mechanical exercises take their life principally from the natural pleasure of doing something, the appreciation of the usefulness of the exercise, and, above all, perhaps, from the teacher's enthusiasm and his skill in varying the exercise. In the most mechanical and lifeless teaching of geography and arithmetic there ever was, the teachers of

a generation ago made the repeating of multiplication tables and lists of state capitals fairly enjoyable by making songs of them. The most healthful incentive, however, to the cheerful repetition of mechanical exercises comes from the establishment of their relation to the thoughts and feelings that should inspire them.

It is also a sound principle not to continue mechanical drills beyond the point of required efficiency, for then they are purposeless and wearisome.

Drill Reviews.—It follows from the nature of drills that frequent reviews are as necessary for purposes of drill as they are for testing the achievements of pupils. It is sometimes thought that the intense enthusiasm and attention produced by good teaching removes the need of drill reviews, but that is a mistake. There is just enough truth in the proposition to make it plausible and to mislead inexperienced teachers. The nature of the mind is such and the demands upon its attention are so numerous and varied that even the best of teaching will fail without the review.

Drill reviews should be largely written. Written exercises throw the pupils on their own resources more than spoken ones and are more permanently impressed upon the mind. Frequently the reviews should be broadly topical and supplemented with outlines, to enable the pupils to hold together in proper relationship the basic elements of what they have learned.

Memorizing Rules and Definitions.—It is sometimes considered unpedagogical to have pupils commit definitions and rules to memory. If teaching is principally confined to the business of requiring pupils to do this, then the opinion is well founded; but otherwise, it is not sound. A definition ordinarily is not a good conveyor of knowledge, but it certainly may be made a good container of it and an accumulator as well. Generally definitions of sciences learned as introductions to the study of them are as meaningless as any that can be thought of. They certainly have little content, but after all, do they not grow rich in meaning as the study proceeds? They serve a useful purpose from the beginning, when they are poorest in content. If pupils are prepared to begin the study,

they have had sufficient experience to give meaning enough to the definition of it to satisfy their minds, arouse their curiosity, mark out, however indefinitely, its limitations, and serve as a guide.

With proper explanations and study, other types of definition, if properly worded, serve as concise means of holding together what has been learned and also as a ready reference. The same is true of rules. Teachers will always find it profitable to require younger pupils especially to commit important rules and definitions to memory; provided, of course, that the wording is concise and accurate and the teaching otherwise good.

COMMITTING CHOICE PASSAGES TO MEMORY.—For a similar reason many choice passages of prose and poetry should be committed to memory and at times recited. They hold ready for reflection, enjoyment, and inspiration, choice thoughts and feelings, and noble intentions. They serve also as models in the effort to master language. As the experiences of life accumulate, they ripen and mellow, and grow richer and richer in meaning.

THE MAIN INCENTIVE.—As has been fairly indicated, the problem of drill is a part of the general problem of habit forming. Both physical and mental habits have their beginning in native, instinctive reactions. When such reactions result in satisfaction, the memory of it prompts to repetition when circumstances suggest it. The carefully-directed repetitions of school exercises result in such economy of effort and such improvement in the character of the work done as are in the highest degree satisfactory. Growth in skill is a constant source of pride, and nothing more healthily stimulates to effort. The skilful skater enjoys his skill and likes to display it. The satisfaction derived from the skilful performance of functions is intensified by the growing appreciation of its present and prospective usefulness and profit.

PART II

THE KINDERGARTEN

CHAPTER X

THE KINDERGARTEN

THE INSTITUTION.—The Kindergarten is an institution designed for children who have not yet reached the age at which their school employments may begin to assume the character of regular and systematic work. Theoretically, as its name implies, it is a place where children may grow as bright, beautiful, and healthy as flowers in a well-kept garden, and do it just as naturally. It is a place for organized and well-directed play, where the children themselves by their likes, in harmony with their natural instincts, indicate the character and direction of the exercises. It is an institution, in short, in which, through play, they attain the best possible physical, intellectual, emotional, moral, and religious growth.

ITS FOUNDER.—The Kindergarten is the invention of Friedrich Froebel. He opened the first one in Blankenburg, Germany, in 1840. It was not devised as an independent institution claiming the whole interest of its founder nor embracing the entire scope of his genius. Froebel had been a successful and original teacher many years before he planned the Kindergarten, and was one of the profoundest thinkers who ever devoted his whole mind and heart to the theory and practice of education. In his genius was ripened most of all that is best in modern educational theory.

In his thought, education is necessary to promote the proper development of the growing man as a member of society, so that he may attain to his proper relation to God, to nature, and to humanity. The Kindergarten is to furnish the proper conditions for the growth of childhood as a preparation for the education of youth, just as the latter is to prepare for the further development of manhood.

Every Kindergartner should make herself thoroughly familiar with Froebel's theory of education as set forth in his own writings, and should imbibe generously of his

spirit, because he was one of the keenest, most sympathetic and enthusiastic of all the observers of child life who ever lived.

HIS BASIC PHILOSOPHY.—Froebel's basic thought is best expressed in his own words. "In all things there lives and reigns an eternal law. . . . This all-controlling law is necessarily based on an all-pervading, energetic, living, self-conscious, and hence eternal Unity. . . . This Unity is God. . . . God is the sole source of all things. . . . All things live and have their being in and through the Divine Unity, in and through God. . . . The Divine effluence that lives in each thing is the essence of each thing.

"It is the destiny and life-work of all things to unfold their essence, hence their divine being, and, therefore, the Divine Unity itself—to reveal God in their external and transient being. It is the special destiny and life-work of man as an intelligent and rational being, to become fully, vividly, and clearly conscious of his essence, of the divine effluence in him, and, therefore, of God; to become fully, vividly, and clearly conscious of his destiny and life-work, and to accomplish this, to render it [his essence] active, to reveal it in his own life with self-determination and freedom.

"*Education consists in leading man as a thinking, intelligent being, growing into self-consciousness, to a pure and unsullied, conscious and free representation of the inner law of Divine Unity, and in teaching him ways and means thereto.*"—Hailman's translation.

DOCTRINE OF SELF-ACTIVITY.—The child's growth is conditioned by his self-activity. This activity must be just what the word implies, activity of the self. It must not be merely an effort on the part of the child to learn or do something demanded of it by the interests and achievements of mature persons, nor involve activities of one type only. Its activity must be many-sided, involve all the elements of its being, and must be prompted by its own instincts and likes. It must be productive, creative activity. Such activity is naturally joyous and stimulating.

PHASES OF SELF-ACTIVITY.—This activity has two phases mutually supplementing each other. By one

phase of it, to use a Froebelian expression, the external is made internal. This is the awakening of the child's emotional life and the development of his knowledge. By the other phase of it, he makes the internal external, that is, he gives expression to his thoughts and feelings and develops his will. Expression is as instinctive and, therefore, as natural to him as the use of his senses. The effort to express leads the child to talk and play and to find pleasure in drawing, modelling, and otherwise making things. If the child's productive activity is prompted by his own interests, spontaneous, it is the expression of his selfhood; it is in the true sense self-expression, and creative self-expression is the best stimulus to increase of knowledge in extent and accuracy.

THE LAW OF UNITY.—While the processes that condition growth are the various forms of self-activity, these processes must conform to one general, fundamental law, the law of unity, or inner connection. This arises from the fact that the universe is a great one, in which everything is related to everything else. This law demands that objects presented to a child for study or handling be properly related to him and to one another, so that they follow one another in a connected series adapted to his expanding life; that the child's life be continuous, passing from one period of development to another without noticeable and abnormal breaks; that the child's mind and body act together as one, and thought, feeling, and volition be but different phases of one mental act; that the child grow up in proper relation, or unity, with nature, with his feet rooted in the ground, as Froebel stated it; that he develop in proper relationship with humanity, past, present, and future; and that he preserve his proper relationship with God, live with his head touching the sky, to use another of Froebel's expressions.

INDIVIDUALITY.—While the child is to be educated to be a component part of the world-unit, he must yet be such a part as a whole, an individual. Every child is born into the world with modifications of the attributes of humanity and with possibilities of growth and action peculiar to himself. This gives him a mission in life peculiarly his own, a mission that cannot be delegated to

another. This proprietorship of special characteristics involves a proprietorship of aspiration, of pain and pleasure, and of responsibility. This constitutes individuality, and individuality is sacred. This individuality is the substantial basis of the doctrine of self-activity and self-expression.

NATURE STUDY.—In order that a child may grow into proper unity with nature, he must live in sympathetic communion with it, must learn to know it. One of the best means to accomplish this is to give children opportunity to cultivate vegetables and flowers, and to take care of pet animals.

PLAY.—The distinctive occupation of childhood is play. No other could so well fulfil the conditions to his self-activity. It is urged from within, it is spontaneous, free, and joyous, and it energetically employs the whole self. It is indispensable not only for the child's present happiness, but also as a condition for maturing the future man and woman. Play is absolutely necessary for the proper growth of bone and muscle and for the healthful development of the vital organs. It affords the best possible beginning of sense culture and of the development of judgment and imagination. It awakens the emotions, and gives wonderful voluntary control of the body. It calls into active life all the child's instincts, and prepares him for the duties and opportunities of life, by leading him to anticipate its occupations and ambitions. In play children are lovers and fathers and mothers; they are painters, poets, artisans, merchants, warriors, statesmen, lawyers, doctors, teachers, and preachers. The value of play is hard to overestimate.

APPLICATION OF THE PRINCIPLES.—Froebel endeavored to apply all these principles wisely and sympathetically in the Kindergarten. He devised for it a series of seven gifts with appropriate exercises, a series of occupations, and a series of songs and mother-plays. These gifts and occupations have since been increased in number. The reasons which he assigned for his choice and for the order in which he placed the gifts and occupations cannot always be considered valid, and there are reasonable objections to one or two of the occupations; but still no other series have been planned to take the place of his.

CHAPTER XI

KINDERGARTEN PRACTICE

THERE are three phases of Kindergarten work, gifts, occupations, and games with songs. With these a skilful and enthusiastic Kindergartner can every day spend a very happy and profitable period with the children from the time they chant the opening prayer together until the last gift is carefully stored away, the last occupation stopped, and the last song ended.

THE GIFTS.—The gifts, playthings, in Froebel's original plan were seven. Kindergartners now use ten or more. When ten are used, they are the following:

1. Six soft woollen balls of six standard colors, red, orange, yellow, green, blue, and violet. These balls are usually provided with strings.

2. A wooden sphere, cylinder, and cube, two inches in diameter and furnished with rods and a standard so they may be revolved.

3. A cube measuring two inches in each of its dimensions and evenly divided once in length, height, and breadth, making eight equal smaller cubes.

4. A cube of the same dimensions but divided once vertically in its height, and three times horizontally in its thickness. This furnishes eight parallelopipeds, or bricks, two inches long, one inch wide, and a half inch thick.

5. A cube measuring three inches in each dimension. This is divided equally twice in length, height, and thickness, making twenty-seven equal cubes. Three of these are divided into halves diagonally. Three others are divided into quarters with two diagonal cuts bisecting each other.

6. A three-inch cube divided into twenty-seven bricks two inches long, one inch wide, and one-half inch thick. Six of these are again divided into halves through their breadth, making twelve blocks, each with two square and four oblong faces. Three others are divided into halves

lengthwise, giving square prisms that may be used as pillars, or columns in building.

7. Sets of square and triangular plane tablets made of wood or cardboard and variously colored.

To this gift is frequently added another consisting of circular and oblong tablets of similar make and color, with a number of circular tablets divided into halves. This may count as a separate and eighth gift.

8. Sticks one-tenth of an inch in thickness and of varying lengths. Some of these are dyed in the six primary colors, while some are uncolored.

9. Rings of silvered wire, some three, some two, and some one inch in diameter. Some of each of these are divided into halves and quarters.

Wooden rings of different colors are sometimes added to these.

10. The eighth and ninth gifts represent straight and curved lines, so a tenth gift has been devised to represent the point. It consists of small shells, seeds, buds of flowers, peas, bits of wood or cork, and pellets of clay.

The First Gift.—It will be noticed that these gifts present to the child the fundamental geometric forms and their elements, and that they are in harmony with the common playthings of childhood.

The ball serves as the first gift because it is the simplest of all unities that may be handled, and is at the same time a universal toy. Its form is pleasing to the eye, it is comfortable to handle, and its mobility makes it simulate life. It moves over the ground and passes through the air with less resistance than objects of any other form, and, therefore, gives greater satisfaction in efforts to project it. To the attractiveness of Kindergarten balls much is added by color.

Any number of games may be devised with the balls of the gift. With the aid of the strings they may be moved in unison up, down, right, and left, or swung in circles to the accompaniment of appropriate songs. They may also be tossed from one to another, and thus be made means to cultivate accuracy of eye and movement and to furnish exercise for the development of health, strength, and grace.

In the handling, the qualities of form, softness, and color become impressed upon the mind, and become clear in consciousness through questions and appropriate exercises. The Kindergartner, for instance, may select a ball of a certain color and ask the children to pick others of the same color out of the baskets of balls passed to them. She may also ask them to find similar colors in flowers, articles of dress, or variously colored sheets of paper.

In like manner she may ask the pupils to name objects similar to the balls in shape or nearly so. They will find marbles, apples, peaches, and other objects to select from.

The Second Gift.—The objects of the second gift are more complex in shape, and present their elements of form and substance partly by contrast with the ball, and partly by contrast with one another. The wooden ball is harder than the woollen balls of the first gift. The cube is not only harder, but presents its corners in marked contrast with their roundness.

The Building Gifts.—The third, fourth, fifth, and sixth, are distinctively building gifts. They present additional solid forms, and increase the child's range of power and skill in the constructive exercises, which naturally delight him greatly. As he proceeds from gift to gift, he finds an increase in both the number of pieces and in the variety of forms. With this increase of skill in invention there comes also an increase of definite form knowledge.

With the blocks the child may build imitations of objects with which his life makes him familiar, as chairs, lounges, walls, well-curbs, houses, churches, and other public buildings. He may also build geometrical forms, as larger cubes, with smaller ones. Then he may also construct such symmetrical other figures as appeal to his fancy.

In these exercises the Kindergartner leads the way by dictating and illustrating the construction of forms, but she always encourages the children to invent forms, and further increases the pleasure and value of the exercises by having groups of children unite in the construction of larger forms by using all their blocks together.

The Other Gifts.—With the seventh gift the child

begins a distinct progress toward the abstract. The first gifts impressed him with their solidity, but the tablets are so thin that the third dimension practically disappears and attention is fixed upon the surface. With the sticks both thickness and breadth are reduced to a minimum and the line is approached as closely as is possible with a concrete object. With the seeds and bits of wood there is a comparative elimination of length as well.

The last gifts lend themselves easily to constructive exercises. The almost numberless and beautiful combinations possible with tablets, sticks, rings, and dots, make these intensely fascinating and give them a high cultural value. The tablets lend themselves with their shapes and colors to varied and attractive mosaic work. This increases the æsthetic sense of the children and lays a substantial foundation for skill in designing.

With the sticks and rings forms are outlined, and the outlines are continued and repeated by the addition of point to point in the shape of the smaller objects used to represent them.

Occupations

The Kindergarten occupations are:

1. Perforating cardboard with a stout needle set in a handle.
2. Sewing.
3. Drawing.
4. The Thread Game.
5. Slat Interlacing.
6. Paper Twisting.
7. Paper Weaving.
8. Paper Cutting.
9. Paper Folding.
10. Peas Work.
11. Modelling.

Because of the premature use of the smaller muscles and the straining of the eyes, the perforating is now generally rejected.

THE SEWING.—The sewing is done with a worsted needle and bright colored zephyrs. It is done on cards

perforated with holes a quarter of an inch or more apart and forming horizontal and vertical series, or perforated in lines forming geometrical figures or the forms of fruits, animals, or other simple and familiar objects. These latter cards generally have the outlines of the objects traced along the lines of perforations.

On the cards which are regularly perforated over all the surface, the children can sew horizontal, vertical, and oblique lines of different lengths, plain squares, squares with crossed lines connecting opposite corners, and other geometrical figures dictated by the Kindergartner or figures invented by the children themselves.

In cases where lines are to be filled out, the children may sew in and out one way and then sew back to fill up the empty spaces.

THE DRAWING.—The drawing is straight line on paper checkered with dots a quarter of an inch apart, circular drawing guided with circular tablets, or freehand outline drawing with cardboard patterns, and freehand drawing of figures of any sort that may appeal to the fancy of the children.

The straight line drawing closely resembles straight line sewing and may be used to cultivate accuracy of eye-measurement and hand movement, facility and taste in invention, and skill in designing. The circular drawing is more difficult, but it may be used to supplement the straight line drawing and serve as an introduction to the drawing of fruits, leaves, and flowers.

The drawing with patterns is always delightful, and serves as an introduction to the freehand drawing of figures generally. This freehand drawing should be free indeed, and it should be one of the means employed by the child to express his percepts of things, to quicken and improve his power of observation, and give him basic skill in graphic portrayal. This is one of the most useful of all arts.

THE THREAD GAME.—The thread game is played by moving a moistened thread on a smooth surface with a stick to form geometric figures and the outlines of simple objects, like beans, pears, peaches, and apples.

SLAT INTERLACING.—Slat interlacing is done with flat,

flexible, colored or plain wooden slats one-half inch wide. These can be interlaced to form different figures in such manner as to hold together, and can be used to construct picture frames, made permanent by means of a few stitches with thread.

PAPER TWISTING.—Bright-colored strips of paper may be made into chains of rings by cutting them into given lengths and pasting the ends together after interlacing link with link. By turning them at proportional intervals they may be made into squares and triangles that may also be interlaced.

WEAVING.—Paper weaving is an interesting appeal to the child's sense of color and color harmony and to his æsthetic taste and skill. The base for this work is a sheet of colored paper cut into strips so as to leave an uncut margin on the four sides. Into this mat are woven separate strips of colored paper with a needle designed for the purpose. By skilfully varying the colors and the order of the interweaving the production of a large number of pleasing patterns is possible.

PAPER CUTTING.—With a little guidance children become adept in folding sheets of paper in such way that they can readily cut out squares and circles, which, in different colors, can be pasted on cardboard to form tasteful patterns. They also enjoy cutting pictures out of rejected papers and magazines. These may also be neatly mounted, as may shapes of fruits, flowers, and animals cut by the children according to designs of their own.

PAPER FOLDING.—Another very interesting occupation is to fold squares, oblongs, and circles of paper into a number of different figures, like boxes, boats, hats, windmills, houses, and flowers.

PEAS WORK.—With peas and pointed sticks of different lengths they can form the outlines of cubes, sofas, chairs, tables, beds, and any number of other objects.

MODELLING.—Modelling is in special harmony with the genius of childhood. To make mud pies is their peculiar delight, and to paddle sand an unfailing source of pleasure. So it is a very easy matter to have children model in clay or putty the solid geometric forms which they

study, and the shapes of simple fruits. It is an unspeakable blessing to them to turn them into embryonic sculptors by letting them model the forms of animals as best they can.

It is evident that some of these occupations are naturally coördinate with the gifts, while others succeed them.

Songs and Games

Song is the natural expression of the joyous life of childhood, the common accompaniment of children's play. So it is a prominent feature of Kindergarten activity and happiness. The songs are numerous and varied in character. There are prayers in song, hymns, and patriotic songs, songs of family relationships, of trades and other occupations, descriptive songs, songs of the senses, songs of natural phenomena, ring songs, and games of courtesy accompanied with songs. Nearly all these songs are accompanied with appropriate actions and movements. Then there are also songs adapted to the gifts and occupations, and gymnastic, dancing, and marching games accompanied with song. These songs are all published in Kindergarten collections.

Nature Study

The gifts, occupations, and games should not, and often do not, exhaust the resources of the Kindergarten. It should bring the children into sympathetic contact with plant and animal life. Whenever possible, there should be plots of ground worked by the children and turned to account by the cultivation of flowers and vegetables. When this cannot be done, the children should raise plants indoors in pots and boxes. It is also well to have birds and pet animals to receive their attention.

Stories

A very important part of the equipment of the Kindergartner is the gift of story-telling to awaken the incipient love of literature and cultivate skill in the correct use of language through reproduction. The stories may take a

wide range. They may include accounts of the origin and production of the materials used, fairy stories, stories of animal life, inspiring moral stories taken from the lives of boys and girls and grown people, and stories to teach the nature of the holidays.

IN CONCLUSION.—The Kindergarten should and, when wisely and sympathetically conducted, always does appeal to the instincts of children " for play, for producing, for shaping, for knowledge, for society, and for cultivating the ground." It should develop sense power, and natural freedom and grace of movement. In its genial atmosphere the spiritual nature of children should bud, and their capacity for happy and coöperative fellowship blossom.

PART III

METHOD IN THE BRANCHES

CHAPTER XII

READING

READING is the most ancient of all the school arts. In the olden time the Chinaman, the Hindoo, the Hebrew, the Egyptian, and the Greek, each founded his schools on a literature which he considered vital to the highest and best interests of the race. There was in this a natural and deep wisdom. The accumulation and usefulness of the mental wealth of the world began with the invention of the art of writing, and it still is through writing that we have our principal means of access to the experiences of our contemporaries and the rich heritage of the experiences of the past. Therefore, to teach the young to read is to perform for them an inestimable service.

FUNCTIONS OF THE READING CLASS.—Naturally the supreme function of the reading class is to prepare the pupils for the intelligent and appreciative reading of valuable literature and the study of the sciences as these are presented by means of books. A second function, incidental and subordinate to this, is to train them in the art of elocution, the oral interpretation of literature. Resulting from this second function there is a third one, namely, the perfecting of the speech and gesture of the pupils.

Primary Reading

THE ENDS.—Many methods have been devised to teach children the first steps in reading. There are always several in the educational market, each claiming superiority over others, and each actually excelling in some important feature. This variety of methods makes it highly important for the teacher to keep clearly in mind the ends to be attained in the primary reading classes, as experience has proved that almost every distinct method, through its emphasis of one or more features of the work, leads teachers to neglect other features to such an extent as to make the work seriously defective.

It is evident that the primary reading classes should learn:

1. To know at sight such words, phrases, and even clauses and sentences, as may be adapted to their capacities and needs.

2. To give prompt and accurate pronunciation to the words and phrases so recognized.

3. To know their use and meaning.

4. To understand and appreciate such literature as is adapted to them when they are called upon to read it.

5. To give proper oral expression to such literature.

They should learn this in such way and with such thoroughness that they will be sure to become skilful and enthusiastic readers of good books and journals both for themselves and for others.

THE INCENTIVES.—Learning to read differs much from gathering flowers in field and forest or engaging in games for the sake of sport and exercise. The taking up of the book is the beginning of serious life, the beginning of conscious identification with the race in its joys and sorrows, its ambitions and hopes, its strain and struggle in the effort to work out the problems of its destiny. The teacher should, therefore, consider well the incentives on which he may depend for the success of his efforts.

One incentive arises from the satisfaction that children derive from an increasing ability to distinguish one written or printed word from another and associate it with the spoken word which it represents, and from the closely-connected ability to analyze words into their literal and sound elements. Recognizing, pronouncing, and analyzing words are for the children forms of activity and achievement and give a consciousness of growing power. It is easy to underestimate the value of such exercises, especially of the analysis, and to think of them as repellent to children because words are lifeless things. It is well that such opinions arise from ignorance of some of the interests of children; for much mechanical drill is necessary, and, in spite of every effort made to give thought value to every word and sentence children are called upon to read, in the early lessons many words and combinations of words must be selected that, to say the

least, are not particularly edifying as far as any thought or feeling they may express is concerned.

Another incentive is found in the pleasure that children experience from associating the same meanings with written words which they have previously learned to associate with spoken words.

A third incentive, the supreme one, arises from the happiness which children derive from the reading of suitable literature, the happiness of learning things new and interesting in an almost magical sort of way by means of a skill that has become their own with effort.

Still another incentive arises from the elocution, from the oral expression to others of what is stated in writing or print. Even older people enjoy doing this.

With these objects and incentives in mind, the young or prospective teacher should be able to get a fair understanding of the work to be done with primary reading classes from a review of the methods of teaching reading that have been extensively used or are so used now.

THE A, B, C METHOD.—The old method of teaching reading, made venerable by centuries of use, was the so-called a, b, c method. It consisted in teaching first the letters of the alphabet, next spelling, and after that the reading of easy lessons.

Very early teachers made a skilful and systematic arrangement of spelling exercises. Combinations of single vowels and consonants were taught first; like ab, eb, ib, ob, ub, ba, be, bi, bo, bu. In the next series of lessons, consonants were prefixed or suffixed to these two-letter compounds; like bab, beb, bib, bob, bub, dab, deb, dib, dob, dub. The spelling lessons following the introductory exercises were graded according to the number of syllables in the words.

For languages with a simple phonetic alphabet like ancient Latin or modern Spanish, in which the consonants have fixed values and the vowels vary, if they vary at all, only in quantity, the method was not necessarily a poor one. Thoughtless mechanical teaching made it so. The letters and their names were taught in the order in which they were arranged in the alphabet. Very frequently the pupils were required to repeat the names of the letters

until they had memorized them before they were taught to apply them to the letters at all. The teachers never thought it necessary to teach their sound values. The pupils were expected to learn these through the spelling exercises.

Learning to spell was thus made a tedious and dreary process. In the first exercises the pupils named the letters in the syllables and the teachers gave the pronunciation. In this indirect manner were the sound values of the letters gradually made known and the pupils enabled to work out for themselves the oral equivalents of written or printed words. Sight and sound drills were unknown.

Learning to read, therefore, was equally slow and laborious. Oral spelling was the pupil's one guide to pronunciation other than the prompting of teacher or classmates, and every unfamiliar word necessitated a stop for the spelling of it. So for a long time even with the bright pupils the reading proceeded haltingly.

Worse than this, the attention needed to identify the words and determine their pronunciation left but little capacity for the thought and feeling which the writer had endeavored to express, even if the teacher thought it necessary to cultivate the understanding and appreciation of literature. This he rarely did. So the intelligence and pleasure to be derived from reading came to the young people but slowly and imperfectly, and the reading in the lower grades naturally had a monotonous sing-song character.

The defects and unfortunate results of the a, b, c method were aggravated and multiplied in English schools. Our orthography did that. The silent letters and the various sounds assigned to the same letters make the reading of English differ from the reading of German or Greek or Latin.

The Word Method.—Radical changes in the method of teaching reading belong to very recent years. Perhaps the greatest of these both in character and results was the introduction of the word method. It proposed to teach words as wholes, assuming (1) that they are the units of language; (2) that if pupils learned to know written or printed words as wholes, the hesitation and

stumbling so common then in the reading of children would be prevented; (3) that reading lessons could be made to have their thought value from the beginning; and (4) that intonation and inflection would be more natural and pleasing.

With this method skilful teachers soon put a life into primary reading exercises such as they had never known before. By presenting to the pupils objects or pictures of them, or by drawing pictures of them at the board, the teacher could get the pupils to learn the printed or written names of the objects with ease. The interest awakened by the method made it possible to teach children to read short and simple sentences with remarkable readiness, accuracy, and naturalness of expression in a short time. With such modifications as the work itself suggested, the method became, at least theoretically, ideal. It was soon found best to teach the words in sentences, as these have meaning as separate words have not. It was also soon found necessary to supplement the learning of words as wholes by phonic and literal analyses to make the pupils capable of determining the pronunciation of new words.

This was all well and as it should be. But what is theoretically excellent, may be very defective in practice. It was soon found that a percentage of primary teachers, possibly a majority of them, either were incapable of training pupils well in phonic analysis or failed to appreciate its value. Hence this part of the work was neglected or was poorly done.

The method also easily deceived teachers into believing that they had accomplished much more than was the case. Much of the apparent reading was little more than a mechanical recital of what had been committed to memory, and the recital was aided but little by the written or printed language.

Pupils who at the end of the year read with apparent ease, frequently proved themselves utterly helpless with new words, however easy. It was a common thing for a word as simple as sat, if it were new, to be pronounced cow, or star, or anything else that chanced to the learner's mind. A bright boy in his second year at school pronounced the word hen *rooster,* because he was guided in

his pronunciation by a picture that illustrated the word, and he misinterpreted the picture.

THE POLLARD SYSTEM.—Such lamentable results of the word or word and sentence methods led Mrs. Pollard, then a teacher in the Pittsburgh, Pa., schools, to devise what she called the "Synthetic Method of Teaching Reading." It is a combined phonic and spelling method. At different times phonic methods have been advocated and tried in the last four hundred years, but no system as complete and practical as the Pollard had ever before been worked out. It is a profitable method to study, suggestive both in its strength and its weakness.

Mrs. Pollard proposed to perfect the enunciation and pronunciation of children and prepare them for skilful reading by means of clever drills in the elementary sounds of the language, by teaching in connection the letters and combinations of letters that indicate the sounds and, at the same time, the diacritical marks needed to make the indication complete, and by still further drills in the analytic marking and sounding of sentences as a guide to their correct and ready utterance. The main features of the system only can be stated here.

First Exercises.—The first step is to have the pupils produce the short sound of a, teaching them the proper position of the vocal organs. The next step is to print the letter a on the board with the breve over it, ă, and require the pupils to sound the letter as soon as the breve is drawn. This is followed by repetitions of the printing and sounding. The seat work of the pupils to supplement this consists in printing the letter a number of times on their tablets and slates, sounding the letter to themselves every time they complete it with the breve.

In a similar way a suitable number of the consonants are taught, commencing with the labials, lip consonants, m, b, p.

The next distinct step is to require pupils to sound ă and m with increasing rapidity of succession until they coalesce, and then print ăm together, requiring the pupils to sound as the printing of the combination is completed. Such a combination she named a family group. ă and b and ă and p are treated in the same way.

The exercise is followed by the making of words by prefixing to the family groups, **ăm, ăb, ăp,** such letters as combine with them to form familiar words, as **e, l, m, n, r,** and **s.**

Then another series of family groups is developed, **ăd, ăn, ăt,** and **ăg,** followed by suitable word formation.

Back-door Keys.—A new feature is now introduced, by teaching the formation of plurals with an added s. The plurals of nouns thus far learned end in two consonants sounded together. Such final groups, whether of two or more consonants, she named back-door keys. They are " tied " with a curved line below, as **t͡s, p͡s, b͡s.**

The pupils are now put to marking and sounding such simple plurals, always beginning at the end of the word, sounding as they mark; c a t s, for instance, **t͡s, ă, e,** ending with the pronunciation of the whole word.

These exercises lead to a new series of family groups, **ăe͡k, ăn͡d, ăn͡g, ăn͡k,** marked as indicated. This gives further opportunity for the forming of words, with suitable drills in marking and sounding.

Front-door Keys.—Now initial groups of consonants are taught. These are also tied, and marked to indicate their sound values, like **e͡r, f͡l, t͡h, e͡h.** At the same time additional back-door keys are taught. In the case of t c h, t is marked silent and c h are tied; thus **t͜ch.**

The Articles.—The next step is to teach words accompanied by the indefinite and definite articles. The obscure sound of the article a is marked with an inverted breve below the letter, **a̯.** The **a̯** is tied to the word or group of words with which it is combined to form a phrase, as **a̯ hat.** The e in the definite article, being also obscure, is marked in the same way, and the article is also tied to the word or words with which it is used; as **the̯ rat.**

The Other Short Vowels.—The other short vowels, **ĕ, ĭ, o,** and **u,** are taught like **ă** in their order and used similarly in family groups and with back- and front-door keys.

Long Vowels and Diphthongs.—After a sufficient number of drill exercises with the short vowels, the pupils are ready to take up the diphthongs and long vowels.

In teaching the long vowels, family groups are used

as with the short vowels. For instance, in teaching ā, drill exercises in word formation and marking and sounding are formed with the groups āk ¢, āv ¢, āc ¢, āg ¢, and the groups ām ¢, ād ¢, ān ¢, āp ¢, āl ¢.

The other long vowels and all equivalents are treated in the same way. In such combinations as e i g h in eight, e is treated as an equivalent of ā and i g h are marked silent, ¢īgH.

Sentence Marking and Sounding.—Before all the equivalents are taught, as early as possible in fact, the pupils are trained in the marking and sounding of sentences. These exercises begin with the last word and always with the end of the word, so that the pupils will be ready to pronounce the words as soon as the marking and sounding of them is finished, and the whole sentence immediately after the last word, the first in the sentence, is pronounced. For illustration take the sentence: The boy sits in the sleigh. The pupil crosses h, and \ in that order, saying *silent* as he crosses each letter, marks e with the subscript macron, ¢, sounds it, ties sl, ¢J, sounds it, then sounds the whole word. So he continues until he is ready to utter the whole sentence.

Devices.—In the system as planned by the inventor each sound is introduced with a story, which also, in a number of instances, gives character names to the sounds and their letters.

One of the special features of the system is the variety of devices intended to make the drills pleasant and effective.

One form of drill in the sounding of letters and family groups is to print the letter or group to be sounded on the rungs of a ladder drawn upon the blackboard, requiring the pupils to sound it each time it is finished and afterwards sound it in the musical scale, up and down the ladder. Another is to arrange a number of letters or family groups in series corresponding to lines adapted to simple, catchy melodies and have the children sing them.

For drills in word-building and pronunciation a rotary board turning about a fixed central board is used. On the central board a family group may be printed and

in the spaces of the rotary board consonants and groups of them that will combine with it to form words. As the rotary board is turned, one letter or "front-door key" after another moves in front of the family group. As it does so, the pupils pronounce the word so formed. For this may be substituted the simple device of drawing a vertical line on the ordinary blackboard and printing the family group to the right of the line and the consonants to be combined with it, to the left; thus:

l m n t r s	ap.

The rules for pronunciation are taught as needed.

Success of Method.—No other method of teaching reading could have so clearly revealed the weaknesses in the practice of the word and sentence methods. The results of the Pollard method were astonishing. Even foreign-born children, Italians, Slavs, Polanders, and Germans, could easily, by the end of the first year at school, work out the pronunciation of long and difficult English sentences and utter the words with remarkable clearness and accuracy. That was a result to be expected. The method cannot fail to make pupils thoroughly familiar with the structure of words; and the repeated drills in letter and group sounds and in marking and sounding so associate the sounds of words and the vocal movements needed for their utterance with the sight forms of words that pronunciation is naturally both prompt and correct.

Weaknesses.—The word and sentence method made it easy for the teacher to connect the first reading lessons profitably with the other exercises of the school, drawing the reading materials from them, as from nature study, for instance. With the use of the Synthetic method this advantage of correlation is lost. By it the first reading lessons are made separate and independent.

As a method it fixes attention on the mechanical side

of reading, and tends, therefore, like the old spelling methods to make reading mechanical instead of thoughtful and inspiring.

It deprives the children both of the pleasure and the profit that result from discovering the sound values of the letters by analysis, and also of the corrective power of the analysis. The latter defect is particularly unfortunate. When elementary sounds are learned and taught as independent things, most of them become so exaggerated and distorted that their repetition serves but little better as a guide to correct pronunciation than did the old-fashioned spelling.

Having to do with the mechanism of language, it has overloaded the mind with machinery. It involves more marking than is necessary, and has burdened itself with too many rules.

Other New Methods.—Recognition of some or all of these defects has led to the invention of a number of new primary reading systems. Prominent among these are the "Ward," the "Comprehensive," the "New Gordon," the "New Education," and the "Aldine" systems. These agree in being efforts to unite the best features of synthetic method with the word and sentence method. They all use groups of letters like the "family groups" of Mrs. Pollard, but differ in the selection and arrangement of these. They either do away with the marking or employ very simple systems of marks. They use cards having letters and "family groups" printed on them for drills in blending, and words for drills in word recognition. A teacher called upon to use one of these methods or choosing so to do, must make special study of it, but can easily do so with success if he understands the sentence method and the principles of synthetic teaching.

Relation of Thought to First Lessons in Reading.—The student of method should now be prepared to recognize the features of primary reading lessons that are vital.

Theory and practice combine to prove that the more closely even the earliest reading lessons are kept in relation with the living thought of the pupils the better. From the beginning the lessons should be carefully cor-

related with the other language lessons, just as these should be carefully correlated with the other school exercises. When the teacher does not develop his own exercises, but uses the charts and books of some accepted system, the book and chart lessons should suggest the oral language exercises to be used in connection with them.

The primary language lessons are:

1. The pupils' first lessons in literature; that is, the stories of the teacher, generally narrated, but preferably related as coming from books so the pupils may desire to command the source.

2. Oral lessons based on pictures.

3. Oral lessons in nature study.

4. Oral lessons based on other convenient objects than those in the nature series.

THE WORD.—We read by words and groups of words. We need the analysis and synthesis only to make us more ready, independent, and accurate in the recognition and pronunciation of them. While it is better to begin with words as wholes rather than with parts of words, words as wholes can best be learned through the sentence, for thus they connect themselves most vitally with thought and feeling. In the sentence they also best begin the establishment of their identity by comparison with the other words with which they are there associated. The language lessons furnish the sentences.

If the teacher uses care in the selection of the sentences, skill in writing or printing them on the board, and tact in having the pupils make effort to identify in the sentences the words to be taught or in pointing them out himself, the work is easy, interesting, and successful. With a good question the teacher can lead the pupils to make the proper sentences themselves, can then have them intently watch the writing or printing of the sentences, and ask for their repetition after the writing or printing is done. This is good preparation for the identification of the words.

After a sentence containing the desired word is written and repeated, the teacher may direct attention to the fact that it is made up of words by asking the pupils to count

the words in it, and so lead to the question asking them to find which is the word wanted. Some one or all the members of the class may now be able to point it out. If none can do so the teacher must point it out for them, and in either event have the pupils compare it attentively with the other words by means of proper questions. The pupils are then ready to have it written separately for drill purposes and to seek for it in other short sentences in which it occupies different positions. The first words are properly names of things and actions, and the articles and neuter verbs may soon be taught incidentally.

THE PLACE OF ORAL SPELLING.—The process of learning to distinguish words by sight differs in no essential feature from learning to so distinguish other objects. Psychologically the explanation of word recognition belongs to the theory of perception. Objects usually become distinct from the mass of which they form a part because of their contrast with some things and their resemblance to others. An almost subconscious comparison and analysis reveal these when attention is fixed upon them. If, for any reason, special attention is fixed upon them, these processes become more distinct and definite, therefore more thorough and comprehensive. If, for instance, it becomes desirable to know well a certain species of tree, its flowers, fruits, leaves, branches, bark, and other parts are carefully studied in detail. What the leaves, fruits, and other parts are to the tree, the letters are to the word. They constitute it. The pointing out and naming of the letters of the word fix attention upon its parts, analyze its form, and more definitely and accurately establish its identity. When a pupil can from memory spell a word correctly both orally and in writing, he certainly knows it.

Oral spelling is a purely supplementary exercise, as is thus seen, and should be so treated. It can easily be begun too early and can just as easily be overdone. The wastefulness of thoughtless oral spelling exercises in the old methods of teaching reading and spelling for a time put it under the ban altogether.

PHONIC ANALYSIS.—What oral spelling is to the word seen, that phonic analysis is to the word spoken. It is necessary to good enunciation and pronunciation. The

correctness of the composite sound depends upon the accuracy and richness of the component parts.

The phonic analysis should be sometimes complete and sometimes partial; that is, the word should sometimes be separated into all its elementary sounds and sometimes in the analysis, sounds that frequently occur together should be treated as fixed composites, "family groups." This is valuable always because of its economy, but sometimes also because some sounds can never be accurately produced except in combination.

The phonic analysis should at first be entirely independent of the written form. This is true partly because our orthography is not entirely phonetic, and partly to keep the written word from diverting attention from the sound. The analysis of the sound cannot be made without a special effort of attention.

The best way to teach the analysis is to lead the pupils to discover the sound elements by having them pronounce simple words, like can, ran, hat, and cat, more and more slowly until the elements separate one from the other.

After the pupils are skilful in sound analysis, they should make such analyses of written or printed words and learn to associate the sounds with the letters or groups of letters that represent them. This is of fundamental importance. It is only so that pupils learn to work out the pronunciation of words for themselves. It is the hope of their free access to literature.

Very early pupils should learn the use of diacritical marks, if not from the beginning. Without such knowledge they cannot use the dictionary.

THE BLEND.—One of the most valuable recent contributions to method in reading is the *blend*. In this exercise pupils form words by prefixing consonants to "family groups," or "compound phonograms" as some term them, and then pronounce them, or pronounce words so formed by the teacher Cards containing such groups and single or combined consonants can be effectively used for the purpose and a board rotating about a centre, such as Mrs. Pollard devised. Synthesis completes analysis.

WORD DRILLS.—There must be frequent drills in word recognition. These can be and should be conducted in

various ways. Variety puts spirit into the drill. One excellent form of drill is to have words and phrases printed on cards, present the cards for an instant to the view of the class, and give the pupils opportunity for rivalry in prompt recognition and pronunciation. Another is to have a number of words placed promiscuously upon the blackboard and ask the pupils to pronounce them as they are rapidly pointed out. Another is to erase words so placed and ask the pupils to name the words erased. Another good one is to have pupils select from a number of cards with words on them, those containing names of objects in a picture presented to them.

In the early reading lessons, even when pupils are already reading the third book in the series, it is well to give such drills on the new words in the next lesson. This prevents the beginning of a troublesome habit of incorrect pronunciation.

EXPRESSION.—With a correct method of teaching, the expression of young pupils largely takes care of itself and is usually good. The correction of defects should mainly be made through subconscious imitation. When that fails, skilful questioning will nearly always lead the pupil to repeat the sentence read with proper emphasis and inflection. A mechanical conscious imitation of the teacher is unfortunate, and to require it is a serious pedagogical fault.

Intermediate and Advanced Reading

READING AS STUDY OF LITERATURE.—As already indicated, the reading classes are primarily literature classes. The intermediate and advanced reading classes are, therefore, our beginning classes in literature, and they must so be treated if they are to have their highest value. Their principal function is to develop the habit of intelligent and appreciative reading of good literature and an eager appetite for it. The most serious evil of a strict adherence to a fixed series of school readers is that they are prepared in an order of increasing difficulty of vocabulary and sentence construction and with reference to a corresponding difficulty of elocutionary delivery. The pupils, in consequence, are obliged to put forth such effort to master the

forms of expression that the attention to meaning can be but slight. It is much better to regard the mastery of a second reader, for instance, not as preparation for the third reader, but as an introduction to the reading of literature presenting little or no greater mechanical difficulties than the second reader itself. Thus the enjoyment of reading is fostered. A library in a schoolroom even of low grade is not, therefore, an incidental luxury, but an indispensable necessity for good work.

INTENSIVE AND EXTENSIVE READING.—Almost from the beginning, in order to secure the best results, two types of reading are needed, the intensive and the extensive. They supplement each other. Quantitative reading cultivates breadth of interest and knowledge, and an increased desire to read. If the reading is sufficiently varied, it also develops a valuable power of discrimination. It tends, however, to make reading superficial and flippant, destructive of solidity of thought and breadth of feeling.

Qualitative, intensive reading, on the contrary, ensures thoroughness and exactness, solidity and wealth within the scope read over; but the closeness of analysis and the limited scope and slow progress incident to it, tend to take the life out of the reading exercise. A judicious supplementing of one with the other improves the quality of extensive reading and increases the ease and pleasure of intensive reading until at last quality and quantity are closely allied.

Generally speaking, the readers of the regular series still universally and wisely used, because of their careful grading, the variety and brevity of the selections, and their adaptation to elocutionary training, present the literature that demands close study. The supplementary reading matter of the classroom invites broader treatment, and the reading which pupils should be encouraged and enabled to do outside of the school hours furnishes the opportunity for the broadest extensive reading.

WHAT IS LITERATURE?—Before considering the method of teaching literature, let us try to get a clear conception of the meaning of the term.

In a broad way all carefully written expression of organized thought is called literature, but the term has a

more restricted use. Some written productions are so suitably and perfectly finished in form and construction, are so exalted in thought, so rich in imagination and feeling, so characteristic of all that is noblest and best in life, so vital to its highest interests, that they are highly prized and carefully preserved. These in the strict sense constitute literature. Their authors are the mouthpieces of the race, and in reading them we commune with the race. Through them we come to a consciousness of what is best in ourselves. We learn to see with clearer vision, to hear with keener ears, to think higher, deeper, and broader thoughts, and feel our hearts throb with nobler emotions.

In the literature of the race, therefore, are the myths and legends which reveal its thoughts and mysteries, its hopes and fears, its heroism and aspirations while still in its infancy; the visions of its seers and prophets; the thoughts of its philosophers; the stories of its novelists; the dreams and songs of its poets; the eloquence of its great teachers and orators; the hopes and ambitions of its patriots and statesmen.

THE FUNDAMENTAL PRINCIPLES.—It is evident that when a man or a woman writes something that is worth the keeping, it is because they have something in mind and heart that is worth the saying, something that is well for us to think and feel after them. The first business of the reading class is to help the pupils find this something, in other words, help them to interpret what they read, give meaning to it. This is a principle to which the teacher should strictly adhere.

INCIDENTAL LESSONS.—After a time the pupils may study with delight and profit the forms of expression, the mechanism of written discourse. They will find there beauties and masterly perfections worth their while. The studies of grammar and rhetoric will help them to do this.

Still later they may study the deeper causes for the utterances, the conditions that governed their making. They will often find these closely involved in racial characteristics that have been developing for centuries, and the study of them will result in a broader and deeper insight into the secrets of the development of the human mind and the progress of the race.

RECITATION OF READING LESSONS.—In order to make the meaning of what they read prominent in the minds of the pupils, it is a good thing, in the earlier grades, to have them recite the reading lesson very much as they are expected later to recite lessons in history and geography; not so closely perhaps, but still with sufficient closeness to develop the main thread of the story or the main thought of the lesson. Frequently, too, especially if several lessons have been necessary to cover the whole selection, it is profitable to have the pupils write out in class the substance of the whole selection from memory. Such exercises are not always out of place in the higher grades. Besides fixing attention upon meaning, they serve as language lessons and habituate pupils in remembering what they read.

WORD MEANING.—The teacher should remember that all writers except in the very simplest of literature employ words with which the pupils are likely not to be familiar. Many of these words acquire meaning from their frequent recurrence in sentences whose general meaning is plain, but many of them need special explanation by definition or illustration. As early as the fourth grade, pupils should be trained to the use of the dictionary so they may as soon as possible be held responsible for failure to find the meaning of such words themselves.

INCIDENTAL HELPS.—Inasmuch as everything in the conduct of the lesson should contribute to the development of its main thought, everything that is irrelevant or discursive should be rigidly excluded from it. So also everything that can make the knowledge more complete, the thought clearer and stronger, should be used. If accessible pictures will do this, they should be brought to the attention of the class, and all needed information incidental to the lesson should either be found by the pupils or furnished by the teacher, if it is not within their reach.

It sometimes happens, for instance, that the thought and feeling, the whole life, of a production or of a passage in it, has its origin in some incident or incidents of the author's life or in some facts with which he was familiar. How can pupils be expected to understand and appreciate if they are unacquainted with these? For illustration, take

"The Star-spangled Banner." Before pupils are called upon to study it, they should know the fear for the country's safety incident to the capture of Washington and the burning of the Capitol and Mr. Key's anxiety as he paced the deck of the British warship that was participating that night in the bombardment of his native city.

READING TESTS.—Lessons worth reading are in advance of the reader's thought and information and generally also in advance of his vocabulary. He is nearly always sure to read something he does not fully understand, and something he will not fully understand without help or special effort. An oral reading lesson has in consequence a double use. It is not only a means of training in correct expression, but also a revelation of the pupil's interpretation of what he reads. Every false tone or wrong inflection, every mechanical ring of the voice, indicates something lacking. It is a note of warning that proper test questions are needed. If the tests confirm the suspicion aroused, then explanation or illustrations are needed or questions well designed to stimulate the proper thought or direct attention to the illuminating facts. Such test questions should be numerous, for it is a very easy matter to overestimate the knowledge and capacity of pupils. It is not safe for the teacher to take much for granted.

STIMULATION TO THOUGHT AND ACTION.—While it is true that we read to know what others have to say, there are objects beyond this. Even more valuable than learning to know what others have said is the enlarged desire to know, the increased power to learn, the purifying and strengthening of feeling, and the healthy stimulation of will power, the firing of ambition. It is well, as opportunity offers, to elicit from the pupils free expression of the desires and aspirations aroused by a reading lesson. When heroic deeds are narrated or any transactions that admit of moral measurement, they should be led to independent valuation of them. When, too, the author expresses opinions, they should be allowed to assent or dissent. More than that, they should be challenged to do so, but always required to give their reasons for the position assumed.

MEMORIZING.—One exercise of high importance that is much neglected is that of memorizing and reciting what has been read. Choice passages of prose and poetry, and, still more so, whole productions when not too lengthy, become priceless treasures when committed to memory, and the reciting of them increases their value. The effort to memorize and the occasional repetition give a certain power of growth to the meaning and beauty of a production. Many a choice bit of literature may become as dear and useful to a learner as an old friend.

One of the best forms of recitation is the dialogue. It puts enthusiasm into the study of literature and life into its delivery. It awakens the dramatic instincts of pupils and prepares them for the study of the great dramatic masterpieces, the highest products of creative literary art.

THE TEACHER'S PREPARATION.—No other lessons require of the teacher more careful preparation than those in literature. One reason for this is that the thoroughness of the preparation largely determines the degree of the teacher's enthusiasm for the author's art and of sympathy with his thought and feeling, and these are of highest value to the pupils. Nothing is so easily communicated from soul to soul as feeling. A pupil's first appreciation of the strong and beautiful in literature is derived more from the admiration and sympathy of the teacher than from the depth and clearness of his own insight.

A second reason is that no other lessons admit of or demand more varied presentation. The same literary composition may please and profit the child and the sire, people extremely varied in temperament and degree of intellectual and æsthetic attainment. But it has a different meaning for each reader or class of readers, and must be taught accordingly.

It is remarkable how many lives a poem may have. It first may catch the ear with its jingle. After a time the jingle may dull, but the poem take a new hold upon the mind with the elevation and subtlety of its thought, or it may fasten upon the heart with the strong tide of its passion. It may, again, become a new object of interest because of the skill evidenced in its construction, the

excellence of its diction, and the originality and beauty of its figures. Yet again it may win for itself respect and admiration as a peculiar revelation of what was deepest and best in the life of the author.

TEACHING "EXCELSIOR."—A brief study of Mr. Longfellow's "Excelsior" will serve to illustrate a number of features in the teaching of a reading lesson. This poem has been recited times without number by school children ranging from the fourth grade to the upper classes in the high school. Beyond a doubt it has frequently been recited by children who enjoyed it and yet were carried along more by its rhythm and rhyme than by any special meaning they attached to it. It is essentially a boy's poem and was written such to be, but it has a substance and spirit that make it appeal to a matured man or woman as well.

It is a narrative poem, and the salient facts of the narrative are,—the youth of the traveller; the Alpine village through which he passed; the approach of night; the banner with its device; the sadness of the youth's brow, the flash of his eye, and the ring of his voice; the inviting warmth and glow of the household fires; the spectral glaciers; the advice of the old man, the appeal of the maiden, and the warning of the peasant; the answering groan, shout, and sigh; the cry near the convent; the dead traveller grasping his banner; and the voice from the sky. These facts are few, and they are simply and beautifully told; yet, strange to say, the ordinary, untrained reader passes over many, if not most of them, without specially noting them or finding in them any particular significance.

The first thing to do for young readers of the poem, is to get these facts clearly before their minds. To do this they should be asked to reproduce the narrative, either stanza by stanza as they read, or the whole of it after all has been read. If any important facts are omitted in the reproduction by one of the pupils, his mind should be stimulated with questions to remember, or he should be required to read again, or his classmates may be called upon to supply the omissions, as the teacher may deem best at the time. Omissions to be filled by some one else are usually better filled by classmates than by the teacher,

so the reader may be incited to read more attentively next time.

For such a simple composition the questions to develop the narrative are easily formulated. Take, for example, the first stanza. Of whom does the poem speak? Where was he passing? What time was it? What did the youth carry? What device was on the banner?

When the pupil once has the facts clearly in mind in their logical order he realizes much of the spirit and meaning of the poem even though he cannot intelligently explain it, unless, indeed, the poem is entirely above his mental level. The next step for the teacher is to enrich its meaning for him. This requires skill and discretion.

In the first stanza there are several things that demand attention. Travellers generally rest at night because of the fatigues of the day and the perils of night-journeying, which they dread. A few questions will lead pupils to think of this. What do travellers generally do at night? Why? Why do people dread travelling at night more than in the day?

The Alpine village will need some attention. It is important that the pupils think not so much of the location of the Alps in Switzerland as of their great height and the difficulties and dangers of the ascent. A picture or series of pictures of Alpine scenery may be used to advantage.

Men carry banners when they wish to make known their devotion to a cause or purpose. This again demands a question or two, perhaps an explanation. The use of the word device is somewhat unusual. The pupils should be asked to give its meaning. The dictionary will help them to it. Last of all "Excelsior" is the key-word of the poem. What does it mean? Which way was the youth passing through the village, up or down?

In the second stanza there are two words not in common use, falchion and clarion. The pupils should be tested as to their knowledge of them, and their meaning cleared, if necessary. With some classes the same may be said of brow. The sadness of brow was due to thoughtfulness and the sense of self-denial and sacrifice. A few questions will be needed to help the pupils realize this.

Why did the youth's eye flash and his voice ring? That was the evidence of his youthful grit and determination.

In the third stanza two words must be disposed of before the passage can have its full value. They are glaciers and spectral. An illustration would give meaning to "glaciers," and the synonym "ghostly" would make spectral plainer. Two questions might supplement the synonym: What made the glaciers ghostly? What effect would the ghostliness have on a man's feeling? Now the pupils are ready for questions like these: At what time of day do people generally most wish to be at home? What did the homes with their warm, bright fires offer the young man? When he turned from the happy homes and saw the spectral glaciers, why did he groan? Why did his groan take the form "Excelsior!"?

A few questions are needed for the fourth stanza. What was the old man's advice? What is lowers? What dangers might be expected from the tempests? What from the torrent? How would the man's age affect his advice? The thought of the perils aroused afresh the young man's resolution. The question to make that vivid in the mind of the reader is, "Why did the youth reply with a 'clarion' voice?"

The maiden's appeal was a great temptation to the youth. Why did he have a tear in his eye and answer with a sigh? What was the answer? Why?

What might a withered branch do? What is an avalanche? What might it do? The peasant, on the outskirts of the village, was the last person who could offer rest and comfort. His words were the last warning and last appeal. They did not deter the youth, they quickened his steps. A few questions should make all this clear. Where did the peasant most likely dwell? What was his warning? What made his warning impressive? What was the youth's answer? Why did it come from far up the height?

The pupils should know what the hospice of St. Bernard is, what the monks do, why their services are valuable, and what use they make of hounds. If the pupils cannot learn this for themselves, the teacher should tell them. Above all they should know its location. It

marks the youth's achievement. He reached the top. The last cry was his death cry, but it still was "Excelsior!" That was the poet's way of revealing the depth and strength of the youth's determination and his sense of something higher still beyond, the prophetic and eternal hope and assurance of noble souls. A few questions may lead the pupils to realize that themselves, though a statement or two may be needed to help them do so. The next stanza will help them, because it supplements and strengthens this. Why did the youth still grasp the banner with his dead hand?

A few questions should help the pupil to realize the climax. Why was the youth beautiful in death? Why was the sky serene? What voice came from the sky? Why was it still "Excelsior!"? These are vital questions. The youth was beautiful in death because he was brave and resolute in life, and faithful to a high purpose. His struggles ended in peace, in the realization of high achievement, and in the happy anticipation of things higher yet to be.

The poem is now very beautiful and rich in meaning, but we have not exhausted it. It is evident that Mr. Longfellow more or less consciously wrote it as an allegorical presentation of the pursuit of high ideals and the results of it. It is then a simple but grand sermon in the concrete, on the nobility of a life faithfully and resolutely devoted to the achievement of high things, and God's reward for it. Older pupils can appreciate this, and a very little suggestion by means of carefully prepared and simple questions will enable them to do so.

There still remains for mature pupils the study of the masterly character and beauty of the composition in the arrangement of the details of the story, the smoothness and music of the rhythm, the skill displayed in the use of the word "Excelsior," and in the excellence of the diction, not to mention the catchiness and perfection of the rhyme.

THE READING OF EXTENDED WORKS.—As before stated, the old system of following up each reader when completed with the next higher number in the series, imposed upon the pupils constantly the strain of the effort

of learning to read and yielded to them too little of the enjoyment of the fruit of the effort. There was still another serious defect in the system. The selections were necessarily short, often extracts from more extended compositions; and even when complete, they were independent fragments of the whole work of the author. The reading lessons thus failed to cultivate the habit of carrying interest and attention through long literary productions and the ability to grasp comprehensively their elements in relation one to the other and so thoroughly enjoying them. That was one reason why so few pupils of the old schools became enthusiastic and sensible readers of books. The pupils never learned enough of an author's work to arouse their enthusiasm nor did they learn enough about him through his work to appreciate him as a literary worker in the broad sense of the term, a literary exponent of the thoughts and sentiments of his time and country.

SUPPLEMENTARY MATERIAL.—One of the greatest blessings to the profession in these later years is the preparation of an increasingly large number of books adapted to the pupils of every grade and of such a character that they may supplement the reader of the grade. By means of these books it is possible to introduce pupils gradually to the intelligent reading of larger literary wholes. This should be done as early as possible. Thus the literary appetite is created; and by the time the ninth grade is reached, the pupils will be well prepared for what is usually spoken of as the study of literature, as distinguished from what is termed reading.

The range of this supplementary reading should be wide. It should include both prose and poetry, myths and legends, tales and songs of chivalry, history, biography, the literature of field, forest, lake, and river now becoming so abundant, and the orations and essays of patriots and other thinkers. The reading of literature should, from the beginning, not be merely enjoyable pastime. It should open the eyes of the reader more to the beauty and majesty of his natural environment, give him a deeper and truer knowledge of human life, and kindlier sympathy with his fellow-men.

The Advanced Study of Literature

Between the elementary and the advanced study of literature there is no sharp dividing line, and the methods applicable in the first stage are still valid in the second. Yet there comes a time in the secondary school when pupils may assume a new attitude towards literature. They are now more mature in thought and feeling, and they have gained a wider range of scholarship and experience. They are prepared to study more systematically and comprehensively the work of literary men and women, understand their wider and higher reaches of thought, appreciate the finer qualities of their art, value better their services to humanity, measure more critically the opinions which they express, and, after a time, also realize, in a measure, the extent to which they are exponents of the time and society which produced them.

THE FIRST READING.—Before pupils are required to study any of the larger productions of an author in detail, they should be prepared for this by a cursory reading of the whole. It is generally better that they do this out of class, guided by a few simple directions from the teacher. A knowledge of the whole, however superficial it may be, illuminates the parts, and the new discoveries of truth and beauty that are made with the help of the teacher in the closer and more critical class study, are a constant source of pleasure and stimulation.

CARE IN TESTING.—Enjoyment is easily simulated, and much appreciation of literature is second-hand, borrowed from some one of supposed authority in literary taste and criticism. The English language is unusually rich in words, especially rich in synonyms. A literary vocabulary may have many words for well-known things and qualities with which people who read much are perfectly familiar, but which are either meaningless or misleading to pupils at school. So it is common to find words with a peculiarity of meaning that escapes the attention of young readers, and yet upon that peculiarity may depend the force and beauty of the passage in which the word is used. Frequently, too, there occur classical or historical allusions or allusions to natural phenomena, which are

plainly intelligible to the teacher but may be entirely unintelligible to the pupils. These facts urge the teacher to be careful and thorough in testing the pupils with questions. In reading, as in passing through field and forest, it is remarkable how many beautiful blossoms may be passed unseen and how much rich music may be poured into the air unheard.

GRAMMAR AND RHETORIC.—It is an easy matter to substitute a grammar or rhetoric exercise or a combination of both for a literature lesson. While it is true that we learn grammar by analyzing sentences, and rhetoric by analyzing discourse, it is just as true that an author does not write for the sake of illustrating grammar and rhetoric. If the grammatical analysis of a sentence or the rhetorical analysis of a passage will make the author's thought plainer or lead to a fuller appreciation of his literary workmanship, then it should be made by all means; but then the grammar and rhetoric are studied for the sake of the literature, and the literature is not sacrificed, as is often the case, for the sake of the grammar and rhetoric. The special study of these subjects must be reserved for periods specially devoted to them.

FIGURES OF SPEECH.—When figures of speech occur, it is not sufficient for the pupils to classify them. That is too much like drying and mechanically labelling plants without seeking to know the truth they reveal in their living beauty or enjoying the perfume of their flowers. The very effort to classify figures of speech diverts attention from their value as condensed and concrete expressions of thought and feeling. The primary thing is to interpret them.

To illustrate the principle, let us study Lord Byron's admirable short poem, "Sennacherib's Destruction."

The Assyrian came down like a wolf on the fold,
And his cohorts were gleaming in purple and gold;
And the sheen of their spears was like stars on the sea,
When the blue waves roll nightly on deep Galilee.

Like the leaves of the forest when summer is green,
That host with their banners at sunset were seen;
Like the leaves of the forest when autumn hath blown,
That host on the morrow lay withered and strown.

For the angel of death spread his wings on the blast,
And breathed in the face of the foe as he passed;
And the eyes of the sleepers waxed deadly and chill,
And their hearts but once heaved, and forever grew still.

And there lay the steed with his nostril all wide,
But through it there rolled not the breath of his pride;
And the foam of his gasping lay white on the turf,
And cold as the spray of the rock-beating surf.

And there lay the rider distorted and pale,
With the dew on his brow and the rust on his mail;
And the tents were all silent, the banners alone,
The lances unlifted, the trumpet unblown.

And the widows of Ashur are loud in their wail,
And the idols are broke in the temples of Baal;
And the might of the Gentile, unsmote by the sword,
Hath melted like snow in the glance of the Lord.

This is a masterpiece of lyric composition. It abounds in figures of speech. What a harvest for the teacher who revels in them, and is not content until he has hunted down every last one of them and attached to it its proper label.

Assyrian, in the first line, is an example of metonomy, more specifically, antonomasia. Cohorts, in the second line, is also a case of metonomy. "Purple and gold," in the same line, are used synecdochically for the purple garments, gold lace and embroidery, and the arms and weapons gilt with gold.

"Like a wolf on the fold" is a simile, as are also "like stars on the sea," "Like the leaves of the forest when summer is green," "Like the leaves of the forest when autumn hath blown," "cold as the spray," and "melted like snow."

"The angel of death" is a metaphor. So also is "the idols are broke."

But now the important thing about these figures is not their classification. The important thing is their descriptive value. To grasp this is not always the simple business it seems to be. The figures came naturally and easily to Lord Byron, and to men of similar culture they are self-explanatory and give meaning and force to the narrative, but with people of limited knowledge they fail to do this. Take, for instance, the word fold. In America

probably not one young person in twenty knows definitely the sort of fold that Byron had in mind, the fold of the East.

The key to everything in the poem, including the use of the figures of speech, may be found in the eighteenth chapter of second Kings, especially in verses 30, 33, 34, and 35. There it appears that the Assyrian monarch, Sennacherib, ridiculed the trust of the Israelites in the protection of their God. He boasted of the other gods he had conquered, and tauntingly declared that the God of Israel could not withstand him. This becomes plainer when it is borne in mind that in those days the god or gods of a people were believed to go with them into battle and with them to be either victorious or defeated.

With this in mind we may be able to find our way clearly through the poem. The Assyrian was Sennacherib, *the* Assyrian because he was the absolute ruler of Assyria, then the great world empire. This is the fact to have in mind above all; the character and name of the figures is a side issue, and should not be an obtruding one.

So the things to note in the phrase " like a wolf on the fold " are first of all these: A wolf is a ravenous animal. He comes to a fold not only to satisfy his hunger, but to destroy ferociously and wantonly. A fold is a stone-walled enclosure in which an Eastern shepherd protects his sheep at night from robbers and predaceous animals. The fold in the poem was the walled city of Jerusalem in which God was protecting his helpless and peaceful sheep, the people of Israel.

Cohort is a term borrowed from the Roman legion and applied to the divisions of the Assyrian army. Xenophon informs us that the soldiers in the Persian armies fought by nations. Byron assumed that the Assyrians did the same. Each nation was headed by its king, arrayed in " purple and gold." And so the poet with a few words marshals the great sovereign of the earth with his subject and allied kings against the God of Israel, the King of Kings.

The simile of the last two lines of the first stanza serves a double purpose. The sea of Galilee being in Palestine, gives locality to the events, local color, as it were. In the

clear atmosphere of that country the stars are numerous and bright. So the "stars on the sea" give the reader a sense of the number and brightness of the spears, of the vastness and magnificence of the host.

"Like the leaves of the forest when summer is green," better than the figures of arithmetic, gives a realizing sense of the vast number of the men, fresh and vigorous in the evening, an array splendid and inspiring to look upon. "Like the leaves of the forest when autumn hath blown," carries the same sense of numbers, but of numbers helpless and dreary in death, for there is nothing more drearily helpless than a withered leaf tossed by the autumn wind. It all happened in a night. How irresistible was the power that laid them low!

The next stanza reveals the nature of the power and increases the sense of its greatness. The metaphor, personification, "the angel of death," brings us face to face with the Almighty. The angels are His agents. We feel his power not only because so vast a host was destroyed, but still more so because the destruction was so sudden. When the breath of the angel in passing struck the faces of the sleepers their eyes "waxed deadly and chill" and "Their hearts but once heaved and forever grew still." The steed's nostril, opened wide in the act of breathing, remained so stiffened in death, and the foam of his gasping was congealed as it shot forth on the turf. "In a moment, in the twinkling of an eye," the vast camp of the great king of earth who had boasted that the King of heaven could not withstand him had become a melancholy horror of death and desolation.

> And there lay the rider distorted and pale;
> With the dew on his brow and the rust on his mail;
> And the tents were all silent, the banners alone,
> The lances unlifted, the trumpet unblown.

Sennacherib's power had melted like snow, and his gods were humbled. Broken were their idols. A "glance of the Lord" had done it.

FORM STUDY.—While it has been stated that the classification of figures of speech is always an incidental and subordinate matter, it must not be inferred that the study

of literary form is a matter of small account. Such is by no means the case. Form in literature is of vital importance. One man says something and no one gives him attention. Another man says virtually the same thing but in a different way, and it catches the ear of the world. The force and beauty of thought depend largely upon the force and beauty of expression.

Pupils should carefully study the characteristics of the different kinds of both prose and poetic composition. They should be trained to perceive the different values of the various forms of sentence, paragraph, and stanza; the office of rhyme and rhythm; the different shades of meaning exhibited by synonyms; the variations of force and beauty in different figures of speech. Much of the last can be taught by requiring changes from one figure to another, or from figurative to plain language, or *vice versa*. Similes may be thus changed to metaphors and metaphors to similes; and allegories, examples of vision and ideal presence, interrogations and exclamations may be converted into the plain language.

Composition Exercises.—Many composition exercises may be employed to advantage to complete the study of literary productions. Sometimes poems may be turned into prose, and often shorter prose compositions may be paraphrased. The pupils should be required to write summaries of the longer works, criticisms of them, descriptions of the characters presented, and biographical sketches of authors. The summaries may advantageously be illustrated either with drawings or with pasted prints.

Criticism of Opinions.—Advanced pupils are often called upon to read that which they cannot and should not be expected to believe. In such cases, and in fact always when opinions are expressed, it is neither wise nor just to endeavor to force them to accept or reject such opinions arbitrarily. They should be challenged, or at least be given opportunity, to express their own views on all subjects that may be open to doubt or variation of interpretation, being required always to state reasons for the views they entertain. If the teacher cannot agree with their judgments, he also should plainly state the reasons for his disagreement. These are important matters, for there is

often special value in reading that with which we cannot agree. It gives us new points of view, broadens our horizon, and makes us more catholic in our tastes and sympathies.

If there are wide differences of opinion in a class on subjects of sufficient importance to warrant it, special formal debates of these subjects may profitably be appointed.

MEMORIZING.—In this advanced work memorizing should not be discontinued. On the contrary, it should be made more prominent. Let any one who has never tested its value make a special study of an oration like Lincoln's famous Gettysburg speech, and afterwards commit it to memory for the purpose of reciting it. He will be surprised at the vitalizing effect of the effort. Every part of the address acquires a new clearness of thought, new dignity, and new grace and power. The choice poetry and prose we commit to memory fills mind and heart with the seeds of new thoughts and feelings and enriches our language.

One of the most valuable of all the exercises of the literature class is the dramatic presentation of parts or wholes of choice dramatic literature. In dramatic action thought and expression ripen best.

BIOGRAPHY.—The shorter works of an author often reveal but a simple and incidental phase of the author's mental life, a mere fragment of it, as it were. Therefore, it may be a mere mechanical overloading of the minds of the pupils to require them to familiarize themselves with an author's life before reading one of these shorter products of his genius. This is not true when a larger work of his is to be studied or his shorter works comprehensively. These are more complete revelations of the man, and the man is a more complete revelation of them. In advanced literary study, therefore, biography becomes a more prominent feature than formerly.

In this biographical study certain facts should be borne in mind. A mere mechanical outline of an author's life is of little value. It may add something to a pupil's fund of general information, but will add very little to his knowledge of the author's work either as a means of

accomplishing a mission or as a revelation of himself and the time in which he lived.

Then again, those phases of the author's life should receive most attention which really illuminate his work. Take the life and work of Milton for illustration. Two phases of his life help us to understand his poetry. They are his classical education and his connection with the revival of Bible study in England and the Puritan revolution. These demand a study of the schools which Milton attended and a knowledge of the early Puritan movement. His prose works demand a further study of his political convictions and activities, not dissevered, of course, from his scholastic and religious culture.

The History of Literature

The discussion of literary biography brings us to the last phase of literary study, the study of the history of literature. The proper introduction to this is the genuine study of biography. It must be evident to all thoughtful teachers that the histories of literature of the type so long prevalent can have but little pedagogical value. They present brief biographical outlines, a list of the author's works, and a few sample paragraphs or stanzas. At a certain stage of a pupil's development this may be a necessary and useful subject for study, but at best it furnishes but superficial and disconnected information. There is something deeper than this in literary history.

Every people that produces a literature at all, produces a literature peculiar to itself, and the literature of any period in its development is characteristic of that period. It makes the most complete expression of its genius, of its soul development, through its gifted writers. They are most keenly alive to the thoughts and feelings, to the hopes and aspirations of their countrymen. They can best formulate them and best express them. To study, therefore, the progressive unfolding of Hebrew mind and life, the field is Hebrew literature. So we best know the Greek through his poetry, his oratory, and his philosophy. The same is true of any other people. China reveals her best self best through Confucius; England through Chaucer,

Shakespeare, Milton, Tennyson, Bacon, Locke, Darwin, and Spenser.

The history of the literature of a people is thus but a phase of the general history of its development. It can be intelligently studied only by those who know well its other history and are fairly familiar in more than a surface way with its literature. Only the beginnings of the study can be made in secondary schools. Anything like a comprehensive study of it belongs to the college and the university.

CHAPTER XIII

ELOCUTION

NATURE OF IT.—Elocution is the oral utterance of literature supplemented with suitable bodily action and facial expression, for the purpose of aiding others in the interpretation and enjoyment of it. Elocution is a fine art. Training in this art is an important part of the preparation for oratory and dramatic presentation, and is the specific means for improving daily speech.

All sound elocutionary training has its substantial basis in an intelligent study of literature and in sensible physical culture. It is logically ridiculous to endeavor to interpret to others literature you do not yourself understand and appreciate, and impossible of success. The best technical training produces but artificial results in efforts to recite literature not clear to the intelligence of the reciter and not stimulating to his emotions. Thought and feeling mould the face, shade or brighten the eye, modify the tones of the voice, and put action into the whole body. In fact, the primary use of oral reading in the school is to reveal to the teacher what the pupils have learned of the lesson. It is the guide to economical questions and explanations.

READING AND COMMITTING.—The reading of the student who is in elocutionary training should be wide, varied, and thoughtful, and should include much literature that appeals strongly to the imagination and emotions; for it is through imagination and emotion that literature may gain control of the face, voice, and body. For this reason dramatic literature has preëminent value for such a student.

The literature should be selected not only with reference to the effects it may make possible, but very particularly also with reference to the intelligence, taste, and expressive capacity of the pupil. Only so may the results be natural and artistically effective.

It is also important that much of this literature be committed to memory and recited. A book necessarily hinders, if it does not render impossible, freedom of expression. For this, thought and feeling respond too slowly to phraseology that must first be selected and determined with the eye. The relation of feeling to the motor reactions that express it is so intimate that the freedom of these reactions intensifies the related feelings, and repression lessens them. Literature that is studied and memorized is woven into the warp and woof of personality, is dyed with the blood of life.

TECHNICAL TRAINING.—Technical training in elocution must modify both the physical and vocal elements of expression and give mastery over them. Accordingly, posture, facial expression and gesture, breathing, and the different phases of vocalization, or utterance, require the teacher's attention.

POSTURE.—It seems almost ridiculous to give detailed directions for posture, and this frequently leads to its neglect. Such neglect has in many instances induced fixed habits of awkward and slovenly carriage that tended to make ineffective reading and speaking otherwise good, and has become a source of embarrassment and weakness to its victims.

In both reading and speaking, unless the subject-matter demands otherwise, the body should be erect without stiffness and restraint, and turned towards the audience. In speaking, the head should be well up so the audience may be taken in fairly with the eye, and the hands should hang naturally by the side, or at least held so that they do not make the speaker appear ill at ease. In reading, the book should be held in the left hand at the proper height for best vision, and the right hand left free for turning the pages and for gesture.

The feet should be set with the heels near each other and the toes turned outward, the right foot slightly in advance of the left. When the feet are in this position it is easy to turn or to shift the weight of the body from one leg to the other by pivoting on the balls of the feet, and it is also easy to move in any direction when it becomes desirable or necessary to do so.

Such position is not to be recommended only because of its gracefulness and consequent effect upon the audience, but also because it contributes to alertness of mind and readiness for bodily action. It is the position of forceful and attractive repose, of ease and confidence. It is the position from which to leap into action, and to which to return after the action is over.

FACIAL EXPRESSION.—Concerning facial expression little need be said. Changes of countenance are so purely reflex and instinctive in character that in actual speaking they take care of themselves, and smiles, frowns, and tears made to order are highly artificial. In advanced elocutionary and dramatic training, however, much attention is given to the face, because it contributes so much to the effect of reciting and acting. This attention, if persistent and judicious, may become valuable. The emotions of the actor do not come with thoughts born, as it were, in his own mind, but suggested by the language of others. The thoughts coming with study do not give the same vigorous impulse to the motor reactions of the face as do native thoughts and original emotions. So directions and suggestions may lead to more intense and vigorous expressions of feelings like joy, hate, anger, and love, and by reaction intensify them and make the acting more realistic. To some intent, primary and secondary teachers may apply the same principle.

GESTURES.—The gestures and attitudes of the body as they accompany natural speech are almost entirely instinctive and imitative. It would seem the easiest matter possible to secure appropriate and helpful gesture, but this is not the case. Gestures are principally made with those parts of the body that are most used in active life and are, therefore, most subject to volitional control. Because of this they do not always so surely, promptly, and gracefully respond to the natural impulses to movement. Any distraction of thought, self-consciousness, or embarrassment, interferes with gesture, either inhibiting it altogether or rendering it halting and awkward. So a sound pedagogy requires us to teach impassioned literature to those who are passionless, imaginative literature to the prosaic, thoughtful literature to the thoughtless,

at least for the sake of variety in culture; and to demand of pupils ill-formed and lacking in vitality, the actions of people vigorous, well-formed, and graceful, and only the effort to make them so can justify the demand.

While it is true that gestures are mainly instinctive and imitative, they yet are characteristic of the individual who makes them. They vary both in number and kind with his temperament and type of mind. The phlegmatic use but few gestures and make them slowly and deliberately, while the nervous are quick of movement and are apt to be over-free with it. So does the intellectual and reflective man differ from the imaginative and emotional. In order, therefore, that gestures may have a natural attractiveness and force, the teacher should not impose a fixed system of gesture upon his classes, but allow free scope to individual differences.

Several things may be done to improve the gesticulation of the pupils. One is to give them confidence in reading and reciting, and to remove occasion for self-consciousness. Confidence comes through plenty of well-directed practice, and confidence and enthusiasm are hostile to self-consciousness. Appreciative reading arouses the enthusiasm.

Frequent dramatic representation with much preliminary practice meets a need in youthful nature and does more than anything else to cause pupils to forget themselves and become enthusiastically identified with what they recite. Nothing could contribute more to free and natural gesture.

Gymnastic, especially calisthenic, drill may do much to improve gesture. It increases vitality and develops masterful freedom, grace, and force in bodily movements. In every school, even where there is no gymnasium, there may be sufficient calisthenic drill to have a marked effect upon the gestures in the reading classes. Such drills are welcome as pleasant breaks in the routine work of the day.

For younger pupils, movement songs may be made helpful. Though the movements are apt to have a somewhat stereotyped character, the singing so causes life to thrill through every nerve and muscle of the body that

the movements come to accord readily with the thought and feeling expressed. It leads body and mind to act together.

The best specific thing to do is to observe the pupils closely while reading and reciting and note well the gestures they naturally make and aid them to improve in the use of them. If the movements are halting or awkward, the teacher to correct them should lead the pupil in repetitions of them until he makes them freely and gracefully and then have him repeat the passage with the movements until language and gesture are fittingly allied. If the gestures lack energy, the teacher should fix the pupil's attention upon the thought with proper questions and again lead him in repetition of the language with the proper gestures forcibly made.

If the pupil fails to make gestures where they would be effective, a question or two may so lead him to appreciate the thought and so arouse his feeling that, either without or with a suggestion, another reading of the passage will be enforced with a suitable gesture.

If a pupil is too free of movement and gesture, it is well to try to make him recognize the dignity and power of repose and suggest the withholding of a gesture here and there where it may well be spared.

BREATHING.—The voice should be strong and musical. Its organ is the throat supplemented by the palate, the tongue, the teeth, and the lips. Through these the breath is vocalized. In speaking much more breath is used and it is more forcibly expelled than under most other circumstances. To speak well it is necessary to breathe through the nose, have good lung capacity, and to have full command of this capacity. It is not possible otherwise to keep healthy the throat and to sustain vigorous utterance for any considerable length of time.

It is important that all the muscles used in inhaling and expelling the breath be strengthened, especially those of the abdomen. Abdominal breathing gives great vocal power and makes possible its exercise with ease and comfort to the throat.

Breathing exercises are very helpful, and can be made an enjoyable break in the routine of school work. They

should be frequent. With the windows thrown open, the exercises may be vigorous and work a marked change in the physique of the pupils. They should be varied so as to reach all of the muscles involved in breathing and make useful every part of the lungs. The pupils may be guided by count as in other gymnastic exercises, and may profitably use dumb-bells with some of the exercises. A few of them are described.

Exercise 1.—Stand erect, take a deep breath, swelling the waist, exhale, using the abdominal muscles in doing so.

Exercise 2.—Stand erect with the hands naturally by the side, place the hands on the hips with fingers forward and the thumbs back, move the elbows far back slowly at the same time filling the lungs, move the elbows slowly forward and the same time expel the breath just as slowly.

Exercise 3.—Extend the arms sidewise with the palms of the hands turned up, curve the arms until the finger tips touch the shoulders; take a deep breath while doing this and also throw the head slightly back; throw the arms forcibly forward with the fists clenched, bending forward the whole upper part of the body at the same time, and forcibly expel the breath while doing so.

Exercise 4.—Extend the arms sidewise with palms up as before; again curve the arms till the fingers touch the shoulders; take a deep breath while doing so; throw the arms forcefully out to the front with hands open, and exhale while doing it.

Exercise 5.—Extend the arms sidewise to the horizontal position with the palms forward; throw the arms straight back until the backs of the hands touch, and inhale while doing it; throw the extended arms around to the front until the palms touch, and exhale while doing that.

Exercise 6.—Stand with the hands by the side, palms turned to the body; curve the arms and hands until the fingers touch the armpits; inhale while raising; throw the hands down and out sidewise, and exhale while doing so.

Exercise 7.—Raise the hands straight up overhead with the palms turned towards each other; throw the

extended arms and upper part of the body backward, and inhale while doing it; throw the arms and upper part of body forward, bending toward the floor, and exhale while so doing.

All these exercises can and should be much varied in force and time.

The Voice

How Voices Differ.—In the use of the voice are distinguished differences in quality, pitch, volume, force, and time. The voices of different persons vary much in quality. The voices of some are resonant and musical; of others, flat and unmusical, or harsh and rasping. This is true also of individual voices under different conditions. Different kinds and degrees of emotion modify the quality of the voice, and its pitch, volume, force, and time as well. Proper breathing influences all the qualities of the voice for the better. Inasmuch as a resonant and musical voice is desirable, and the vocal ability to express the whole gamut of feeling with ease, intelligent efforts at voice culture should form an essential part of the business of teaching elocution, more particularly so as it improves the use of the voice in daily speech.

Quality.—Radical changes in the quality of a person's voice are not easily effected. Singing exercises may much improve it, as will also breathing exercises and drills in pitch, volume, force, and time. Whatever contributes to vigorous health tends to do the same thing. Growth in appreciation of the finer things in literature likewise favorably affects it.

Drills for Pitch, etc.—There may be and should be direct drills for pitch, volume, force, and time. They may be profitably combined with efforts to make articulation distinct and pronunciation correct.

No matter how carefully the primary work in reading is done, there will, throughout the school course, be more or less need to teach pupils how to use the dictionary and to insist on their using it. Almost every day new words occur and old errors in pronunciation stubbornly reassert themselves. These habitually mispronounced words and

difficult new ones very particularly offer themselves for drill exercises.

Still more are demanded drills in articulation. Because of defective vocal organs, physical weakness, timidity, carelessness, and overhaste in utterance, the articulation of the pupils needs constant attention in order that it may be made and kept clear and distinct. The demand is increased by the fact that in many portions of our country the population had its origin in many lands and that the vocal habits of many languages makes the utterance of different sounds difficult.

It is, therefore, necessary to continue the work of the primary reading classes by giving drills in the production of the elementary sounds of the language, especially of those sounds that without the drills would be imperfectly made.

In a community in which the use of German cripples the utterance of English, there will likely be trouble in the use of v, w, and j. Only persistent drill in the placing of the vocal organs and in sounding can possibly remedy the defects. Change in the pitch, force, and time of utterance keeps the drills alive and renders them effective.

In sections where the New England or Southern influence dominates speech, similar attention must be given to the sound of r, because it is usually much softened or altogether rejected. Where the Irish influence is strongly felt the sound of a in car is likely to be imperfect, and must, therefore, receive special attention.

Similar drill exercises may be used for all the elementary sounds of the language either separately or in groups. A scale, for example, of a, e, i, o, u may be formed, beginning with a repetition of these letters one after another in a whisper and ending with a repetition of them in the loudest yell that will not injure the voice, or beginning the repetition in the deepest base and ending in the shrillest treble within the limits of safety. Both the scales may be repeated with variation of volume, force, and rate.

Phrases and sentences may be treated in the same way, especially such as repeat sounds hard to produce distinctly or keep from slurring, like the old drill exer-

cises: "He had oars to row her over," and "Theophilus Thistle the successful thistle-sifter." A skilful teacher can easily invent any number of similar exercises. So he can make expressions that naturally lend themselves to a whisper or such as just as naturally lend themselves to a loud yell, to base tones or shrill tones, in fact, to any degree of pitch, force, or volume; as, "Is he asleep?" "Fire! Fire! Wake up!"

Such exercises are incidental and more or less mechanical. They mostly lack the essential element of feeling. They may be listless in execution and so fail of their purpose. It rests largely with the teacher to prevent this. With enthusiasm and skilful suggestion he may put such interest and action into the exercises as to give them high value.

Laws of Vocal Qualities.—The laws of vocal qualities are easily learned by observation. There is for every man a normal pitch and volume of voice and a normal force and rate of utterance. These are the pitch, volume, force, and time of speech employed in the matter-of-fact affairs of business, and in the ordinary conversation of social life. Individuals differ much in these, but all change from that which is normal for them in very much the same way under the same conditions. These modifications of the voice occasioned by varying conditions are governed by deep laws of being.

A person highly excited with pain or grief talks more rapidly than usual, with a higher pitch of voice, and in louder tones. A person become thoughtful or melancholy talks more slowly than usual and in graver tones, while an angered person talks more forcibly.

A piece of literature may demand any number of changes in the characteristics of the use of the voice from a person quick to understand and emotional of temperament; but the majority of people are neither of these, and respond but slowly even to that which is most simple and universal in its appeal to the minds of men. To enrich the expression of such it is necessary to increase their intelligence and widen and deepen their sympathies. The specific means to this in the school is to have them study and recite much typical literature, that is, literature that

in a masterly way expresses distinctly the basic forms of emotion.

TIME.—Of all the characteristics of utterance, time is one of the most important and also one of the easiest to explain. By time is meant the rate of utterance. It may be relatively slow, fast, or moderate. When the speaker expresses thoughts that are deep and large, thoughts of things sublime and deeply affecting vital human interests, or of events that awake feelings of sadness, solemnity, and awe, the rate of utterance is slow. Expressions that are nothing more than meaningless sound and jingle and thoughts that excite feelings of gaiety and incite to lively, spirited action, prompt to rapid utterance.

We have abundant literature of both kinds. Among the poems that compel reading in slow time and simple in its pathetic beauty is " Somebody's Darling."

Into a ward of the whitewashed halls
  Where the dead and dying lay,
Wounded by bayonets, shells and balls,
  Somebody's darling was borne one day—
Somebody's darling, so young and brave;
  Wearing yet on his sweet pale face—
Soon to be hid in the dust of the grave—
  The lingering light of his boyhood's grace.

If a student clatters rapidly over this, it is evident that he does not dwell on the facts narrated nor seek to impress others with the reading of them. Whether he is nervous and excited, whether he has been careless in his preparation, or whether he is narrow and shallow in thought and sympathy, to fail to help him get as much as may be out of the poem is to miss an opportunity to do him a great service.

It will not suffice to tell him to read more slowly and show more feeling, or to imitate the teacher in a better way of rendering it. The proper thing is to fix his thought sympathetically upon the essential things in the narrative.

What are "the whitewashed halls"? Who was brought there one day? Was he young or old? How young? How does the poem indicate this? Why was he brought there? What makes a battle magnificent?

What makes it terrible? For what did "somebody's darling" sacrifice his life? What made the sacrifice pathetic? Who was the somebody? Was she there? Did she know of this? Would it have comforted him and her if she could have been there to pillow his weary head and quiet him into his last sleep?

Is it likely that after a few illuminating questions, the reading could again be careless and unfeeling?

> The curfew tolls the knell of parting day,
> The lowing herd wind slowly o'er the lea,

should suggest the sinking into silence of the noises of the day, the slow spreading over the sky of evening's dusky curtains, and the growing solemn silence of the night. These things fill the heart with awe. When the reader feels that, he cannot read rapidly.

Much reading of literature of this type cultivates appreciation of it, awakens a desire to share with others the enjoyment and inspiration it begets, and gives ability to read it well.

A description of a horse-race with the rush of the animals, the rapid hoof-beat, the varying fortunes of the race, and the excited shouts of the spectators, would have a different effect. A reader of such description must have sluggish blood in his veins and a dormant imagination if he does not read it with spirit and dash. If he fails so to do, a review of a race he has witnessed may help him to realize the spirit of what he reads, and put some of its action into his voice and gesture.

ELEMENTS OF TIME.—There are two elements in time, the time of utterance and the time of the pauses. In slow time, the reader dwells on the separate thoughts. He prolongs both the utterance and the pauses. In rapid time, he hurries from thought to thought, quickening the utterance and shortening the pauses. The longer pauses are due to suggested thoughts or to mental recovery after effort. The short pauses are due to the vigor and snap of excitement and to the eagerness of interest.

The pauses are due to a law of mind. We think by pulses. One thought follows another with a flow and ebb of effort. So we think and so we read. Usually we do not

utter separate words, but phrases and clauses made up of words closely linked. So we read with a pause more or less distinct between each effort, dividing the pulse-beats of the mind.

This grouping may be imperfect from one of two causes or from both combined. The pupil may not be able to recognize all the words of a group readily enough to pronounce them together. Word drill will correct this. He may, however, fail to interpret the author's meaning correctly. When that is the case, the thought must be corrected.

PITCH.—By pitch is meant the key of the voice, its grading with reference to height or lowness of tone.

In excitement the voice naturally pitches high, as it also does when there is eagerness to talk or when a strong effort to talk is necessary. When there is repose or repression of feeling, the key of the voice is low. When children are frightened, they not only cry aloud but in a high key. They also pitch their voices high when they give eager accounts of their Christmas gifts. Grown people in this respect differ not a whit from children.

With a variation of the purposes of speech, the changes of pitch are equally marked. If a person says, "You know this," with a lowering pitch, or inflection, as it is generally called, he asserts a conviction that such is the fact. When the same words are used with a rising inflection, they have an entirely different meaning. They then indicate doubt, question, or surprise at the presumption of claiming such knowledge.

The changes of pitch make the melody of the voice. Whether caused by voluntary effort or by the influence of thought and feeling they are generally spoken of as its modulation. The upward and downward slides due to motive are called its inflections.

THE LAWS OF MELODY.—The laws that govern melody, as already described, are few and simple.

Eager utterances, utterances made with effort, and all expressions of uncontrolled feeling are keyed high.

Solemn thoughts, settled grief and sadness, and controlled mental states generally are keyed low.

Incomplete statements, statements implying doubt or

surprise, and questions that do the same or seek information, take the rising inflection.

Completed statements of fact, all positive assertions, and all questions equivalent to assertions, take the falling inflection.

Mental states, however, are not always simple. There may be a combination of assertiveness, surprise, doubt, and anger that affects inflections in a marked way. Such states produce what is termed a circumflex inflection. It begins with a rising and ends with a falling voice, or *vice versa,* as the state of mind may compel.

SPECIAL NOTES.—Teachers sometimes lead pupils to use the punctuation marks as guides to pauses and inflections. This apparently comes so near to serving well as to be pernicious. Punctuation marks are mostly grammatical, and they seem to serve so well because the grammatical structure of sentences is in such vital accord with the flow of thought. In spite of this, however, the method is often seriously misleading, and substitutes a mechanical process for a very interesting and useful live one.

An interrogation point does not mark a rising inflection, for example, it marks a question. If the question implies an assertion or command, the inflection is falling, not rising.

If a pupil has not been trained in an artificial system of inflection, the inflection he uses in uttering a sentence indicates his interpretation of it. If the inflection is wrong the interpretation is wrong.

The comma also is not primarily a guide to inflection, and when so used it may just as seriously mislead. While a sentence never ends with a comma and is, therefore, never complete at one, it often consists of a series of statements each of which might be used as an independent one, or of a series of phrases or clauses very positive in character. In such cases each phrase or clause naturally takes a falling inflection and is followed by a distinct pause even though it ends with a comma, though the inflection and pause are not as complete and final as at the end of a sentence.

FORCE.—Force is the energy with which anything is

said or read, whether in a whisper or with a shout, and reveals the depth of earnestness in the delivery or degree of excitement. Lack of force in reading a passage that is itself forceful indicates either a personal weakness or inertness that cannot easily be overcome, or a failure to grasp the significance of the literature. A little stirring up and a little enthusiasm on the part of the teacher will help much in the one case, and a few suggestions in the other.

CLIMAX.—Sometimes the reader of spirited literature is so deeply stirred that the vehemence of his delivery exhausts him before he reaches the climax of the passage. It is well to remember that energy in oratory is most effective when it accumulates for a final overwhelming outburst. This constitutes an oratorical climax that corresponds to the rhetorical one. Such climaxes rest upon a deep mental and physical law of action and attention.

STRESS.—When force manifests itself in the utterance of one part of a word more than of another, or of one word of a group more than of the others, it is termed stress. When this is placed upon the first syllable of a word, it is said to be radical; when upon the last, it is said to be final; and when upon some syllable between, it is termed median.

EMPHASIS.—Stress is one of the forms of emphasis, and this is one of the most important features of oral delivery of any sort. Emphasis gives prominence to words and syllables, and so to the ideas which they represent. More than any other vocal aid to thought it fixes for the hearer the relative value of ideas and adds to the force and beauty of what is said.

Emphasis is produced in different ways, sometimes with stress; sometimes with change of inflection; sometimes with a pause; and, most frequently, with a combination of two or all of these. Stress often manifests itself in tones louder or lower than normal. The fiercest stress may be given to a word by uttering it energetically in a hissing whisper. This involves a change in the quality of the voice. Extraordinary emphasis nearly always has such an effect.

The Law of Emphasis.—The law of emphasis is

the correlate of the law of attention. The prominence of an idea in consciousness gives emphasis to the word that expresses it, and the degree and kind of emphasis vary with the degree and kind of attention.

When standing alone, independent of outside influence, the sentence, "The little girl carried water to the men in the field," would be read in four groups of words ending respectively with girl, water, men, and field. These words would naturally have the strongest claims on attention, with "carried" next in order. Carried would be obscured more or less because it follows girl and immediately precedes water. So it stands between two high beats of attention, and suffers the reaction from the one and from haste to the other.

The sentence would, therefore, be read with a slight inflectional stress on girl, water, men, and field, and each of these words would be followed with a pause. Field would be pronounced with a falling inflection and followed with a complete pause, because it concludes an assertion. The reading may be indicated thus:

The little girl carried water to the men in the field.

Any shifting of attention would cause a corresponding change of emphasis. A series of questions may be devised that would change the principal stress to every word in the sentence. If the sentence were read in answer to the question, "Which girl carried water to the men in the field?" little would be pronounced with stronger emphasis than any other word in the sentence. The question, "How did the girl take the water to the men?" would place the strongest emphasis on the word carried in the answer; "What did the little girl carry to the men?" would place it on the word water; "To whom did she carry the water?" would place it on men; "To which men did the little girl carry the water?" would locate it on field. Telling a pupil to read a word with more stress or with a rising or falling inflection, what shall be said of it?

Guide to Emphasis.—Sentences, however, in the regular reading lesson do not stand alone. They are connected with other sentences, and it is mainly this connec-

tion that must help the reader to determine the relative status of the ideas in the mind of the author. When mistakes in emphasis occur, it is the teacher's duty to refer the pupil to the related facts in the context by means of statement or question in such way as to effect the correction of the mistake.

If the sentence presented above stood in connection with others that told how a little girl and a little boy were playing at the spring when the men in the field called to them to bring water, and clearly indicated that the girl and not the boy carried the water, the emphasis on girl would be stronger because of it. The increase of stress would be still more marked if it were definitely stated that the little boy dipped the water out of the spring and the little girl carried it to the men. In that case boy and girl would receive similar emphasis and greater than any other words because of the contrast in the functions performed.

New and striking ideas and distinguishing modifiers are emphasized, though the stress on a modifier ordinarily is secondary to that of the term modified.

Mental acts are repeated with a lessening of attention. Recurring ideas, therefore, lose emphasis in statement just as new ideas receive emphasis from their fresh claim on attention.

In cases of excitement, however, whether in anger, pain, or pleasure, up to the point of fatigue, repetition intensifies the mental state and increases emphasis.

Contrasted ideas challenge the mind to vigor of action and produce marked emphasis. In a somewhat lesser degree the discovery of similarity generally does the same thing.

Notes.—In the independent sentence analyzed above, the emphasis is partly determined by implied contrasts. The phrase, "the little girl," implies that it is not the little boy, or the little man or woman, that carried the water. Even though no such other persons are mentioned, the possibility of their presence influences the mind, however vaguely.

An idea stated may also by implication rob a succeeding word of emphasis it might otherwise have. In the sentence, "He put shoes on his feet," to emphasize feet

would be ridiculous unless there were a specially expressed occasion for doing so. He would not naturally put his shoes on his hands or his head. In case of dispute, however, as to whether he put his shoes on his feet or set them on the table, feet would become emphatic in the adverse statement.

QUALITY.—As in the case with the other attributes of the voice, its quality varies not only with individuals but also with the same individual under different circumstances. The qualities of voice have been variously classified. The public school teacher is especially interested in the normal orotund, guttural, and pectoral tones, in the clear, ringing tones of happiness, and the sombre tones of grief. The first and the last two claim his particular attention. The best training of quality comes indirectly with much reading that makes strong demand for the different phases of it.

At first thought it may seem unnecessary to make effort to cultivate normal tones, but that is a mistake. Normal tones are the easy tones of ordinary conversation. To read literature that should find its proper expression in such tones, and read it well, is a fine and rare art. To read the expressed thoughts of other people as if your own is difficult because it demands the laying aside of personal habits of thought and speech and assuming those of another. To do this for other people increases the difficulty, because it adds the fear of criticism and lack of sympathy. This in itself is sufficient to change the quality of the voice and make it sound unnatural. It is easier to learn to read, more especially to recite, emotional literature well, because the excitement of imagination and feeling tends to overcome self-consciousness.

Familiarity with literature, which brings with it quick understanding and keen appreciation, and much practice are required to produce the confidence and comfort in reading necessary to pleasant, easy, normal tones.

The orotund quality has the three elements of depth, fulness, and resonance. It is possible only to persons physically fitted to it. It is for such the natural expression of ideas that are stately and majestic, thoughts of profound and vital importance, and of feelings that are deep

and solemn. The recitation of Thanatopsis or the ninetieth psalm in a thin, high-pitched voice is funny because of its incongruity. The fact that most hearers would smile at the reading indicates how easily the incongruity is recognized, and serves as a hint to the teacher. The reciting of such literature imparts something of its quality to the voice of the reciter.

What is true of the orotund is true of the other qualities of voice as well. It is almost impossible to read Poe's "merry jingle," and "tintinnabulation" of the bells without getting some of the jingle and tintinnabulation into the voice, and it is just as impossible to read Field's "Little Boy Blue" in tones of merriment and laughter.

PUBLIC PERFORMANCES.—All technical training in elocution if well done finds its most evident rewards and its best stimulus to patient and enthusiastic effort in successful public performances. Schools or classes in them should as frequently as possible without sacrificing other interests give public performances of a literary, especially dramatic, character.

CHAPTER XIV

THE USE AND SCIENCE OF LANGUAGE

LANGUAGE is the one universal means of expressing human thought and feeling, and the strongest bond of human fellowship. It is man's most effective agent in business, his readiest resource for pleasure, his most sympathetic medium of comfort and consolation, his most stimulating spur to aspiration and ambition, and his best aid to the higher achievements of intellect.

Of all languages, our own English tongue is the most modern. In spite of its wealth of words, it is also the simplest, its barbarous and irrational spelling alone excepted. It has the characteristics of the peoples who use it. They are a composite of much that is best and most vigorous from many lands. They have inherited more richly than any others of the results of human effort and achievement in the past, and yet have broken most absolutely from its trammelling traditions. They have gone forth conquering and to conquer, circling the earth with a restless energy and ambition that will not be denied. Masterful in industry, business, and government, they have developed a language that is terse, simple, direct, and forceful, and yet capable of wonderful grace and refinement.

It is the duty and should be the privilege of every one born to the use of it, to learn to use it well and to understand thoroughly the principles of its simple and beautiful structure. This makes language training one of the most important in all the series of our school arts; and the absence of marked local dialectic peculiarities and of such a complicated and troublesome mechanism as even the relatively modern French and German languages have, should render the task easy and pleasant.

RELATION TO OTHER STUDIES.—Language training cannot effectively be made a thing separate. The more vitally it is connected with the other work of the school, the more interesting and successful it will be. It must

keep pace with the growth of thought and feeling. The knowledge that is grasped most surely and with most enthusiasm and the emotions that most deeply stir the soul lend themselves most readily to free and correct expression. Every class, therefore, in which pupils learn to know things well and become willing and eager to tell of them, is incidentally, under a sensible teacher, a good language class. Training in the use of language is thus closely correlated with the sciences and literature.

LITERATURE THE CHIEF HELP TO LANGUAGE.—Among the correlated branches of school activity, literature is preëminently the queen. It largely deals with the same subjects as the sciences, but it deals with them in a different way. The production of literature always involves the exercise of the poetizing, creative faculty and the passion of the artist. Naturally the literary type of thought finds expression in language livelier and more elegant than any other. The superiority is further increased by the writer's artistic sense impelling him to perfect and polish the language which he uses. So the highest source of inspiration and the best guide to the good use of language is in literature, and literature is also the proper field for the grammarian and rhetorician.

The language training given in a period specifically devoted to another purpose, must never be regarded as a sacrifice of that purpose to the linguistic needs of the pupils. As knowledge completes itself in expression, so the teacher completes his efforts to impart knowledge by securing the clear, exact, and adequate expression of it. Even in a branch apparently so far removed from the language studies as arithmetic or geometry, the statement neat in form and correct in construction, punctuation, capitalization, and spelling, is essential to good work. Nothing is more productive of slovenly, illogical thinking than careless and slovenly statement.

GROWTH OF VOCABULARY.—A lesson in any subject when well taught develops new ideas and modifies and vitalizes old ones. This creates for the pupil an active demand for new words and tends to modify his phraseology. Best of all, it loosens his tongue or sets free the tongue's substitute, the pen. The full fountain overflows.

In a live class of any sort the minds of the pupils eagerly grasp new knowledge, joyously gain new insight, and their hearts glow. Like magic the suggestive statements of teacher and classmates cause new ideas to spring into being, partially formed ones to become perfect, vague ones to become clear, and disconnected thoughts to fuse into logical and comprehensive unity. The teacher says little, the pupils say much. The phrases, clauses, and sentences of the answers, questions, and incidental statements of the pupils are coined at white heat and are plastic. If they are defective in diction and construction, the pupils should be required to correct them immediately after the thought has received proper attention. This correction is valuable not only with reference to the mistakes made at the time, but also in that it cultivates the habit of carefulness in the use of language and thus prevents numberless other mistakes thereafter.

Topical Recitations.—Many lessons offer opportunity for topical recitations, and topical recitations are composition exercises. They should be both oral and written, each form having a value peculiar to itself. Aside from promoting the ability both to speak and to write, the oral recitation, on the one hand, tends to develop readiness and freedom of thought, while the written recitation cultivates terseness and accuracy in both thought and language. Mistakes are never so glaring as when set down in black and white and thrust upon sight.

The correction of these topical recitations must necessarily be incidental. If it is made as thorough and complete as it should be in other composition exercises, it will divert too much attention from the subject under consideration and defeat the main purpose of the recitation. It should, however, be a genuine correction made by the authors of the mistakes, and not merely a criticism offered by the teacher. It should be applied to the most serious and obvious mistakes, and be sufficient to hold the pupils to their best effort at all times.

Review Compositions.—In addition to the topical recitations, there are needed in most branches extended compositions covering a series of closely-related lessons.

They serve not only as the best comprehensive reviews of the main facts gathered from the text, but they also aid the pupils to organize into a logical and compact body all they have learned about the subject whether from the text or in a supplementary manner. These compositions may also take the form of literary or historical criticism, or of discussion of political or moral questions.

As a rule, these compositions should not be corrected by the teacher, but should be carefully marked for correction by him and corrected by the pupils, and again submitted to his inspection after correction. It is well for the pupils to preserve these corrected exercises in books devoted to the several branches, and illustrate them with drawings or with pictures, like the Perry or Harrison pictures, pasted in the proper places. For the marking of mistakes a simple system of characters like those used by proof-readers is excellent.

Special Language Classes.—While much good language training is incidental, in this as in other school work special classes are needed. In the lower grades, where a teacher has charge of all the work of a room, a large portion of the written work incidental to other branches of study may be profitably dealt with in the language class. This is also possible in higher grades under similar conditions. Where the work of the school is departmental, this can be done to a much less extent, yet the language teacher can accomplish most good if he works in harmony with the other teachers. Lists of common errors in such cases should be referred to him by the other teachers. He has more time for the drill necessary to correct them than they. Written exercises that demand closer criticism and fuller discussion than is possible in other classes without too great a sacrifice of time, should also be referred to him.

Two Kinds of Language Instruction.—The work of the language classes has two phases that should always be distinct in the mind of the teacher. These are the use of language as a means of expression and the technique of language. In the earlier grades, training in the free, exact, and elegant use of language is the main purpose, while the technical training is incidental. In the

higher grades, the order is reversed and technical training becomes more and more a matter of first importance. So the language class at last becomes a grammar class and a rhetoric class, with incidental composition exercises.

Special Composition Lessons and Their Value.—Incidental composition exercises do not satisfy all the demands for training in the use of language. They are too limited in scope and direction, and dominated too much by the lessons studied, for all the best results that are to be desired. The reproductive element is too prominent. The individuality of the pupil in the use of language is insufficiently developed. The composition lessons of the language class should give the pupils the largest range of freedom, and so completely reveal their weaknesses, cultivate originality, and give them the consciousness of strength.

Oral Exercises.—The first composition lessons should be oral. The spoken language antedates the written, and is its proper basis. Efforts to express thought in writing too early destroy spontaneity.

Pupils should be asked to tell only that with which they are familiar and which is of special interest to them. They should be hampered as little as possible in the telling either with criticism or correction.

It is best to make the first exercises oral reproductions of short stories either told or read to them by the teacher.

Early in the course should begin the occasional selection of stories with reference to the development of admiration for deeds of heroism and patriotic devotion, and for the exercise of such virtues as truthfulness, kindness to men and animals, gratitude, generosity, and politeness. Such stories, if simply and sympathetically told, are not only interesting to children, but also have a profound influence on character.

Picture Lessons.—Pictures, if well chosen, are also valuable sources of composition material. They interest children exceedingly, nourish æsthetic taste, and cultivate the power of observation and imagination. First lessons with them must frequently be developed with questions. These questions may not only direct attention to the details of pictures and get the pupils to talk, but they may

be so put as to begin in the pupils the habit of developing a subject systematically.

Inasmuch as pictures have a wide range of plain illustrative power, from the simplest presentation of facts in plant and animal life to the highest manifestations of human emotions and aspirations, the picture lessons may be continued throughout the course. These may be made to touch every phase of the mental life of the pupils, and thus strengthen and refine their characters while enriching and beautifying their language.

NATURE STUDY.—The nature study of the pupils is another never-failing source of excellent material. To accomplish its best results, the nature class should confine itself pretty closely to exact descriptions of objects studied, but it gains many experiences that may be freely treated in the language class. Many of the nature study excursions are exceedingly pleasant, and may be described enthusiastically by the pupils, as may also a number of objects of side interest incidentally met with on the way. In the language class a more poetic interpretation may be given to facts observed than the nature study class would permit, and the emotional life thus more enriched. To the nature subjects also belong the stories of pet animals owned by the children, or objects of their care and affection as possessions of their families. There could be no better subjects for speech or pen.

OTHER SOURCES.—Still other subjects are to be found in the ambitions of the pupils, and in the daily experiences of interest to them other than those incidental to their class work. Their games, holidays, picnics, and any unusual occurrences that may be witnessed by them, all can be turned to excellent account.

While child life is so rich in its enjoyments, so eager in its curiosity, so enthusiastic in its activity, how can the language teacher fail to find matter that prompts to speech?

TRANSITION FROM ORAL TO WRITTEN COMPOSITION.—The teacher and pupils had better develop the first written compositions together. As one part of it after another is created, the teacher should write it on the board in proper form, skilfully soliciting the help of the pupils

so that they may feel that they are participating in the work. After the writing is done, they should be required to copy it. A useful help in the first and second grades is the copying of the reading lessons by the pupils. They thus learn much about form, spelling, punctuation, and capitalization.

As early as the fourth grade, if not before, the pupils should be taught the correct forms of letter-writing. After they have learned them they may write some of their compositions in this form. A new interest may be added to the work if some of these letter compositions are addressed to their parents or other close relations, or to intimate friends, and mailed to them.

PARAGRAPHING.—In a simple way the principle that governs division into paragraphs may be taught as early as the second grade. The pupils may be led to talk about two objects and help the teacher to write a composition about them. The statements concerning each may be so grouped into two separate paragraphs under the suggestive guidance of the teacher, that the pupils will see the propriety of the grouping. Pairs of objects that will serve the purpose are easily found. Two dolls belonging to one of the girls, or two pet dogs belonging to one of the boys would answer beautifully.

Later the teaching of paragraphing advances with the training in simple systematic description. For suitable subjects the teacher and the pupils together arrange an outline of topics in some natural order, and in the composition which follows each topic commands its own paragraph. Thus for an orange, the order peel, pulp, and seeds naturally suggests itself. A little later, because more difficult, should come the development of system in the narration of events witnessed by the pupils.

Technical Lessons

FOR FIRST GRADE.—Technical lessons are properly introduced as they are needed in the composition lessons, but special technical drills are best reserved for special periods. In these periods, first grade pupils may be trained to begin sentences and proper names with capital

letters, to use the period and interrogation point at the ends of sentences, and the period after abbreviations. They should also learn to avoid a number of the grammatical mistakes that children are apt to make.

DRILLS FOR CAPITALS AND PUNCTUATION.—A little enthusiasm on the part of the teacher makes it easy to devise drill exercises that will accomplish the desired results in a way interesting to the pupils. For the initial capital and the period at the end of the sentence it is only necessary to ask the pupils to make statements about objects with which they are familiar and, after writing one or two to show them how such written statements must begin and end, write several more asking the pupils how to begin and how to end. After that they may be asked both to make and write the statements, and required to do the thing correctly. If such exercises are repeated at intervals, they become habituated to do the thing properly. If the statements are written on the board, the mistakes may be seen at a glance and the pupils required to correct them immediately.

Questions may be treated in the same way. The pupils may be given opportunity to ask them and then directed to write them after being shown how. By having them write both questions and answers, the lessons on the use of interrogation point and period may be combined. When the lessons on the use of capitals with the names of persons and places and of periods with abbreviations have been added, the different lessons may be combined in various ways.

It is not difficult to teach the use of capitals in names of persons or places. The pupils must first be told the use of them in such names and then be led in the application of the knowledge. Questions about the boys and girls at school will bring answers to be written. "Jane, where did you see Willie Jones at recess?" The answer: "I saw Willie Jones on the play-ground," may be written by the teacher, who asks how to begin Willie and Jones when he comes to the words, and why the words should so begin. "Where does Mary Williams live?" brings the answer: "She lives in Stroudsburg," and this again gives opportunity to ask how to begin Stroudsburg, and why.

GRAMMATICAL DRILLS.—Drills to correct grammatical mistakes sometimes require considerable ingenuity; but they can be made interesting, and must be continued with patience. Bad habits of speech as well as of morals are not corrected by the mere statement, "That is not right." The first year attention must be confined to but a few elemental mistakes.

To illustrate the method let us take "There is" or "There's," improperly used in such sentences as "There's many girls on the bench." The secret of correction lies not in grammatical explanation, but in getting the pupils to use the correct form frequently with attention fixed upon it. A crayon box and a number of different objects will furnish material for the needed statements made in answer to questions. Place a number of marbles, for instance, in the box and ask: "What are in the box?" If the answer is: "There's marbles in the box," have it corrected, and the corrected form repeated several times in response to the repeated question. The same marbles will serve for several other questions that may be treated in the same way. "Are there few marbles in the box?" "Are there many marbles in the box?" "Are there large or small marbles in the box?" The writing of some of the corrected answers makes the eye the ally of the ear.

When, as often is the case, some or all of the pupils in a class use "I were," "He were," and "They was," the sentence exercises designed to correct the mistakes may be supplemented with repetition of the conjugation:

I was	We were
You were	You were
He was	They were

The pupils will enjoy the saying of it, and it will help them much, though it cannot take the place of the sentence-making.

SECOND GRADE TECHNICAL LESSONS.—In the second year pupils should learn the use of capitals to begin the names of countries, months, and days. They should also learn to use the apostrophe as the mark of the possessive case, the indication of ownership, and also as the mark showing the omission of one or more letters. They should

learn, too, the use of the comma with words in direct address, and after words in series. All this is easily done with exercises in sentence-writing.

In this grade the work of correcting the mistakes in the use of common irregular verbs should be continued and broadened. The forms of past and present perfect tenses demand special attention.

THIRD GRADE EXERCISES.—From the third grade on there should be particular attention given, without neglecting the work begun in the previous grades, to the future tense of the verb, to the common troublesome plurals of nouns, to the pronouns, and to the use of adjectives and adverbs in the different degrees of comparison.

SPECIAL NOTES.—Always the sentences constructed in these exercises should, if possible, be the expressions of active thought. Very little can be accomplished with mechanical exercises. For this reason good judgment is needed in the use of sentences submitted to pupils for the insertion of words in spaces purposely left for them. This device may be employed to serve one of three useful purposes, either to enrich the vocabulary of the pupils, to make their use of it technically correct, or to make them familiar with the grammatical functions of words. Whether it shall accomplish any of them, depends upon the definiteness with which the end is kept in view, and the skill with which the end is sought.

This device may be used to special advantage in cases where one form is habitually used incorrectly instead of another, as when adjectives are used instead of adverbs, nominative pronouns instead of accusative, or singular verbs instead of plural, or *vice versa*. A few examples will illustrate this. John's shout was —. John shouted —. Willie's shout was — than John's. Willie shouted — than John. The exercise is all the better if preceded by a loud shout from John and a louder one from Willie.

CORRECTIONS.—After pupils have once been carefully trained in correct forms of expression, they should be held to strict account thereafter in the use of them. With respect to their other mistakes there must be wise leniency, lest they become too self-conscious in the use of

language; but mistakes in the use of such expressions they should be required to notice and correct in every case. If they are held to their best and neatest work at all times and are gradually led to develop critical power in the use of language, a surprisingly large number of other mistakes will gradually disappear without special attention.

Much of the correction of written work should be done by the pupils themselves. Defective sentences may be written on the board for criticism and correction without making known the pupil whose work it was. Specially good sentences should be presented in the same way. Criticism that praises is as necessary as criticism that discovers and condemns errors. Sometimes the exercises should be thoroughly revised by the teacher, to show the pupils what may be done with a well-considered use of language and to stimulate them to stronger effort.

Grammar

PRIMARY TEACHING OF IT.—Commencing in the fifth grade, if not in the fourth, one lesson a week should be devoted to oral lessons in technical grammar. These lessons should be oral not because the pupils are not then able to read, but because the lessons can so be made more purely inductive, as they properly should be.

WHAT IS GRAMMAR?—The indefinite and practically valueless definitions of grammar commonly given in the text-books, suggest the question, "What is Grammar?" A short answer to the question is that grammar is the science of the sentence. As the botanist analyzes and classifies plants, so the grammarian analyzes and classifies sentences and parts of sentences. Through the analysis of plants, the botanist learns the parts of them, the relation of the parts to one another, and the laws that govern the growth and structure of plant life. So the grammarian by the analytic study of sentences comes to know the elements of which they are composed, the relations of these to one another, and the laws that govern the proper construction of the sentences.

VALUE OF THE STUDY.—There is no reason why the study of sentences, which express the thoughts of men and

are characteristic products of their minds and hearts, should not be intensely interesting, and it certainly can be made very profitable.

Though the interest is different in kind, the study of grammar develops the same sort of intellectual power and skill as is expected to result from the analytic natural sciences.

It is a helpful preparation for the study of other languages. Every teacher of foreign languages knows how seriously handicapped is a student of another tongue if he has not made himself fairly familiar with the grammar of his own.

It reveals the directness, virility, and beauty of the English sentence and increases the satisfaction that men should have in the use of it. This is especally true when the pupil's scholarship becomes sufficiently broad to enable him to study historical and comparative grammar.

It prepares the pupil to criticise intelligently and correct his own sentence structure, and this is a more important matter than at first sight appears. The value of such ability is obscured by the fact that in the use of language so much is determined by habit formed mostly under the influence of unconscious imitation or under the guidance of others, but it must be remembered that habit is a good guide only when correct and when unquestioned. The moment any doubt arises concerning the correctness or propriety of an habitual act, there is sure to be embarrassment that may prove distressing. The highest type of skill in the construction and use of sentences can be acquired only by those who have been prepared to test and perfect their work by sound and thorough technical training.

The study of grammar has, therefore, in common with other sciences, a twofold value, one as a mental discipline and the other arising from its practical applications; and, like arithmetic and other sciences of much practical use, its disciplinary value is most perfect when it best performs its practical functions.

THE METHOD.—The definition of grammar is the best guide to the proper method of teaching it. If grammar is the science of the sentence, text-books and teachers are

of use only as they help pupils to study sentences effectively. Words, phrases, and clauses have grammatical values as they are used to perform certain functions in sentences. Take the word girl, for example. Apparently it is a noun, but dissevered it is merely a word out of employment. In the sentence, "We have an interesting girl baby at our house," it is an adjective. If a boy were contemptuously called a girl, he would be likely to respond with, "Don't you dare to girl me again," and so use it as a verb. In the sentence, "Gladly is an adverb," the word gladly, as another instance to illustrate the point, is not an adverb but a noun.

SUBJECT AND PREDICATE.—Perhaps the first technical lesson will be to teach pupils to distinguish subject and predicate. The numerous sentences they have previously constructed make this an easy task. Have the pupils form a number of sentences by making statements or asking questions about different things, and write the sentences on the board. Request them to read the first one, and ask first what it tells something or asks something about, as the case may be; and after that, what it tells or asks about the thing. Preferably the first sentence is declarative. Do the same with several more sentences, until the two parts of the sentences read are promptly separated without mistake. The pupils are then ready for the statement that that about which the sentence tells or asks something is the subject, and that which is told or asked about the subject is the predicate. Then request the pupils to read the subjects and predicates of the remaining sentences or of the sentences in a new series, always, at first, requiring them to state why they name the respective parts as they do. After they can give the reasons for calling them so in clear and concise language, the first lesson is complete, though several periods may be needed to make it so. Subsequent constructive and analytic exercises will confirm the advance in knowledge made.

This order is a natural and sensible one: first, the objective development of the idea; second, the name; third, the definition; and fourth, the drill exercises. It will serve as a guide to all the oral lessons.

The subject and predicate of imperative sentences are

not included above, because too difficult for the first lessons.

THE NOUN.—To teach the noun, have the pupils make a sentence about some person or thing or place. Fix attention upon the words as the elements of the sentence by asking how many words the sentence contains. Now ask whether all the words have the same use, and follow this up by giving the pupils opportunity to name the uses of as many words as possible, and so make the use of the word that names the person, thing, or place as distinct as may be by comparison with the uses of the other words. After this has been done with a sufficient number of sentences, the pupils may be taught to call such names nouns, and the exercise may be repeated until they think of names of persons, places, or things as nouns. So the formulated definition acquires real content.

THE ORAL SERIES.—In the oral language lessons the pupils should learn to know:

1. The noun; its classes, common and proper, its numbers and number forms, and the possessive case.
2. The verb; its number forms, the few tenses in the use of which mistakes are frequently made, and the cases of agreement.
3. The adjective; its classes, common and proper, and its comparison.
4. The adverb and its comparison.
5. The pronoun; its cases and case forms.
6. The prepositions and conjunctions.

The teaching of these things will involve the use of any number of constructive exercises otherwise very valuable, and will serve as an excellent introduction to the text-book study of grammar in the sixth or seventh and succeeding grades.

TEXT-BOOK STUDY OF GRAMMAR.—When pupils begin the study of a text-book on grammar, there is a decided change of method. The general statement instead of closing a series of exercises, more frequently introduces it and derives meaning from it. Though the order is reversed, the same principle of method must be recognized: the sentence must itself reveal the secrets of its structure.

PARSING.—The study of the sentence takes two forms, parsing and analysis. Parsing involves a partial analysis, but includes additional elements. To parse is to state the relation of words to one another, but it also consists in determining and stating the grammatical qualities, and modifications of the words. Grammars generally give regular forms for parsing, and they are convenient but not good to use all the time. It is characteristic of statements that frequently recur in series to become mechanical in reproduction, so that they have but slight hold on attention. It is better at times to ask pupils to state only the grammatical qualities and modifications of form that under the circumstances have special importance.

Parsing is a more important exercise in the study of Latin or any other highly inflected language than it is in the study of English. It is a form of review and keeps fresh in the minds of the pupils those changes of form that indicate the functions and relations of words. Because English has so largely lost its inflectional endings, in the study of its grammar, parsing may become something but little better than a meaningless clatter. There are but few cases of agreement that demand frequent repetition of forms, and there are few other changes of form that need much attention except the principal parts of irregular verbs, the plurals of some nouns, and the declensions of the pronouns.

ANALYSIS AND DIAGRAMMING.—As pupils must resort to parsing in order to discover the functions and relations of some of the words of a sentence, so it is by analysis that they are led to discover the functions and relations of all the parts of a sentence. So the parsing serves as a preparation for the more comprehensive analysis that is specifically so called.

It is so common to use diagrams to indicate analysis that it is easy to consider the diagramming to be an essential part of the business, or at least as important as the analysis itself. Neither is the case. The diagram merely represents the analysis, and instead of aiding the process, it frequently interferes with it detrimentally. It always does so if the system is not simple, as it then diverts too much attention to itself.

Diagramming must never be used as the only method of indicating analysis. For reasons not always easy to see, practice in diagramming makes it possible for pupils to do the work so mechanically that they entirely miss the object of the analysis. Careful examination of grammar classes will reveal that this is true to an astonishing extent. The proper use of the diagram is to enable both pupils and teacher to do much work in little time, but the saving of time must never involve the sacrifice of the quality of the work done.

Analysis and Parsing of Reading Lessons.—The natural tendency of analysis and parsing to become mechanical exercises is increased by the fact that in the grammars the practice sentences connected with the different lessons are selected with special reference to those lessons. The pupils, consequently, know what they may expect to find in them, and, under guidance of the examples of work given, generally find what is expected with but little effort. For this reason it is well, at intervals, to assign selected portions of the reading lessons for parsing and analysis. After the grammar text is completed, it is profitable to have pupils analyze and parse some standard literary work which they have read. Always, of course, while reading literature, when the grammatical analysis of a sentence may make clear its meaning, otherwise obscure, the analysis should be required.

Constructive Exercises.—While the method of grammar is analytic, the final test of the knowledge gained is found in synthesis. The pupil who can construct a sentence containing a noun phrase when directed to do so, certainly knows what a noun phrase is. Analytic lessons on the parts of sentences should be followed by the construction of sentences containing such parts. With such teaching of the parts should always go the teaching of the punctuation marks necessary to set them off. Without this the knowledge is incomplete. The constructive exercises so train the pupils completely in the practical use of grammatical knowledge and keep it from going to seed.

Throughout the years of grammar study one period

a week may be profitably reserved for such exercises in addition to special drills in the use of pronouns, plurals of nouns, and the tense forms of verbs. The list of such exercises may be greatly extended. Clauses may be contracted into phrases, phrases expanded into clauses, fragments of sentences may be combined to develop skill in organizing sentences clearly and compactly, simple sentences may be united to form complex and compound ones, and complicated sentences may be separated into terse simple ones. In cases of agreement of verb with subject, subjects may be changed in person or number or in both, and special exercises may be devised to illustrate the proper uses of may, can, might, should, and would. Any number of exercises, in fact, may be resorted to that will increase the pupil's knowledge of the sentence and his skill in its use.

COMPOSITION.—During the years of grammar study, the grammar class is properly also the composition class, not only on general principle, but especially because a composition class can be made one of the best of grammar classes. It is in this class that the pupils can be best trained to turn their grammatical knowledge to practical account. This training they get when they are required to correct their own work and give the reasons for the corrections. The analysis of their own often loosely constructed and otherwise imperfect sentences, tests and perfects their skill in analysis as no other exercise can.

One period a week should be reserved for this composition work, and it should be made to include correct social forms, like invitations and acceptances or refusals, common business forms, and common forms of advertising, as of wants and objects lost or found. All the composition exercises may be made more interesting through a school paper.

Rhetoric

LITERARY STRUCTURE.—Every literary work that has either survived the wrecks of time or is destined to do so, is the expression of organized thought, and is, therefore, also the organized expression of thought. Its structure reveals the exercise of care and a high degree of artistic

skill. Its parts are fitted together in an orderly manner, and are made up of materials so selected and so combined that it is an harmonious whole, clear, forceful, beautiful, and interesting.

While this fine literary workmanship permits a great variation of taste and choice, it yet involves the observance of certain fundamental principles and laws. These serve as guides in the construction and arrangement of the larger parts of discourse, the introduction, body, and conclusion, and the chapters and paragraphs; in the construction and arrangement of sentences; in the use or rejection of figures of speech; and in the choice of words. In their practical application they are modified by the purpose and nature of the discourse. The study of these things is the province of rhetoric.

Nature of the Science.—As grammar is the science of the sentence, so rhetoric is the science of discourse. As the grammarian classifies sentences, analyzes them, and determines the relations of their parts, so the rhetorician classifies the different kinds of discourse, analyzes them, and thus determines the laws and principles of successful literary production.

The object of the study is twofold. One purpose is to increase the profit and pleasure which pupils may derive from the study of literature, and the other is to train them to be properly skilful and effective in their own discourse. As a glance at a number of text-books will show, there may be much variation of the order in which the different phases of the subject may be developed. Apparently the order is not a matter of great importance, but concerning the ends that are to be attained there should be no difference of opinion whatever. They determine the character of the teaching.

The Analysis.—In studying the various parts of discourse, it is not sufficient to make analysis of detached examples such as are usually given in text-books. There must be much analyzing of literary masterpieces for a knowledge of the details of composition; and after the principles that govern the details have been mastered separately, there must be further study of short masterpieces to impart a realizing sense of the effect of all the

details together upon the whole production. Always the details must be considered with reference to the whole. In rhetoric, sentences are not merely sentences as they are in grammar; they are parts of discourse. The questions concerning their characteristics cannot be settled in the abstract, but on the basis of their effect on the whole combination of sentences. So questions concerning diction are not altogether to be determined by fixed rules; they are largely matters of general principles, and of taste guided by good usage, and, finally, matters of harmony.

CONSTRUCTIVE EXERCISES.—As in the study of grammar, the best results are possible only if theory and practice are combined in a sensible manner. There must be much constructive composition. The constructive exercises assume three forms: (1) Constructive exercises that insure the theoretic and practical mastery of the details of the subject, as the making of different kinds of sentences; (2) Criticism and correction of defective fragments selected from the writings of the pupils and from other sources; (3) The writing of different kinds of discourse.

POETRY.—Inasmuch as a large part of the world's best and most inspiring literature is poetical, a course in rhetoric is not complete without study of the principal forms of poetry and the elements of poetic composition. This study may also with perfect propriety and much profit include the writing of poems by the pupils.

CORRECTION.—Both the prose and the poetic work of the pupils demands of the teacher close supervision and careful correction. This should be done with kindness and sympathy. It should seek to do more than correct the pupil's language. It should go back of that and correct his habits of thought, improve his taste, and inspire him with enthusiasm for good work. It may be made a delightful task for the teacher, and establish a bond of union between him and the pupil that will be a source of mutual benefit and happiness throughout life.

CHAPTER XV

SPELLING

THE ability to spell readily and accurately is a necessary accomplishment, but for those who use the English language it is one hard to acquire. It demands much wasteful use of time and energy as compared with the other functions of intelligent life. It is highly important that this waste be made as small as possible. In the teaching of spelling, therefore, the teacher should use rare judgment as well as patience.

NATURE OF THE SPELLING PROBLEM.—If English spelling were purely phonetic, it would be easy to teach. The method then would be to teach first the sound values of the letters and train the learners to associate these with the letter forms and names. This could be done either analytically or synthetically. The next step would be to teach first the simple combinations and then gradually the longer ones by means of oral exercises. The third step would be to develop skill in committing the combinations to writing. This would parallel the second step and be guided by it. The ear would guide the eye and the hand. Spelling would be mainly a matter of correct pronunciation and good judgment.

As the case stands, however, with our system so largely irrational, the primary appeal is to the eye, and accuracy in spelling is mainly a matter of mechanical and persistent drill. In consequence of this the chief fault in teaching spelling is apt to be that the exercise is made mechanical entirely, and that the phonetic basis of the art and judgment in its practice are neglected.

FIRST SPELLING LESSONS.—With any method of teaching reading other than the synthetic, the first spelling lessons consist in copying words, phrases, and sentences from the blackboard. This exercise fixes in the mind the forms of the whole words as seen at the board and as written by the pupil. There is an association of the word as seen, the word as pronounced, and the series

of muscular movements necessary to write it. The number of words learned in this manner in the reading class is increased by all the new words used in the written work of other classes.

The teacher should keep an accurate record of all these words and use them for special written spelling lessons.

After the words of a spelling exercise have been written, it is not sufficient to have the pupils mark the words incorrectly spelled and report their number. The proper thing to do is to have each pupil write the correct form after each misspelled word, correcting his own mistakes. He may be helped to do this in a number of ways. The teacher may write each word of the lesson on the board and let the pupils compare their work with his, or he may spell the words orally, or have the pupils do so, each spelling one or more of the words as called upon. It is well to have the pupils enclose the corrected forms in parenthesis and draw lines through the incorrect. Always the teacher should examine the exercises, and he should keep lists of the words misspelled, especially of those most commonly misspelled. The pupils also should keep corrected lists of their misspelled words. These lists furnish the material for special drills.

Oral Spelling.—When phonic analysis begins in the reading class, then almost immediately should begin oral spelling, the analysis of words into letters. The phonic analysis and literal analysis should be so closely allied that the pupils may rapidly learn the sound values of the letters and the principles of phonetic spelling.

The first oral exercises properly are, as they always have been when sensible, the spelling of purely phonetic simple words and such phonetic parts of words, compound *phonograms*, as frequently occur, like at, an, ag, en, ed, followed by the spelling of words in which they are found, as cat, rat, plat, man, ran, pen, men, red, and led.

After these exercises should come words with the common combinations that are nearly phonetic, words ending in ack, ock, ake, ale, and ail. In close connection with these belong words containing common diphthongs.

Oral spelling is a prominent exercise properly in the

first three grades. After that it is profitable only as an occasional and incidental exercise. It is valuable only to teach and keep fresh in mind the sound values of letters and the simple combinations of them and as a means of teaching syllabification. When pupils spell orally they should separate polysyllabic words into their component syllables at least by pauses if not by separate pronunciation. As oral spelling is little more than a guide to written spelling, to spell orally words in which the sound values of the letters are not evident is mostly a waste of time. So in the early grades also the oral spelling must be connected with written spelling or the full results will not follow.

Two Sources of Error.—After the pupils have been taught to spell by both ear and eye, the teacher should give particular attention to the mistakes with reference to their origin. They may be due either to wrong auditory or to wrong visual impressions, or to both. To correct intelligently he must know to which source they are due.

Word Drill.—Because so much depends on the form knowledge of words, the devices used in the reading class to develop skill in word recognition should be frequently resorted to in the spelling classes of the early grades. Words may be printed or written on cards to be turned face outward to the class for a moment so that only quick and accurate vision will tell what the word is, or numbers of words may be written on the blackboard to be pronounced by the pupils as they are rapidly pointed out or erased by the teacher, or several pupils deficient in ability to spell may be placed at the board with erasers as rivals in erasing words called for by the teacher.

Attention to Structure.—Such exercises together with oral spelling and the correction of mistakes tend to fix attention on the peculiar structure of words and make it a matter of interest. This particularizing of attention with our difficult system of spelling is very important, and it should be guarded and fostered as carefully as possible.

It is easy for pupils to pore over the spelling lesson mechanically. Every lesson is likely to have repetition of much that is familiar, and familiarity is hostile to lively interest. For this reason sentence dictation as a spelling

exercise can be safely recommended only as an occasional exercise. There is in it a too frequent recurrence of words easily spelled. Its chief value lies in this that sentences taken from current literature test the ability of pupils to spell common words that might otherwise be overlooked.

THE SPELLING MATCH.—It is a pity that spelling matches do not now claim as much favor as formerly. Inasmuch as oral spelling has a distinct value of its own and is an indispensable part of the business of making good spellers, the match should come back again. Its rivalry created a lively interest in the difficulties, peculiarities, and principles of word structure, and made people proud of ability to spell. In other words, it put a premium on the mastery of a useful and necessary art, and put life and interest into the training for it.

SPELLING BOOKS.—There has at times risen strong objection to the use of spelling books. The objection is nearly always due to the fact that teachers injudiciously carry the exercises from the book far beyond the available vocabulary of the pupils. When this is done, even if the pupils are required to look up the meanings of the words in the dictionary and illustrate their use in sentences, the practice is not good. With the objection removed spelling books may be valuable, and they certainly are convenient.

SPECIAL NOTES.—Whether a spelling book is used or not, there are certain peculiarities of English spelling that demand special drills and special rules. Such are words that are alike in sound but different in spelling, like aisle and isle, hew and hue, knew and new; words that have similar combinations of letters but differ in pronunciation, like rough, cough, dough, plough, and through; words that double the final consonant before a suffix beginning with a vowel, like begin, beginning; words that change a final y into i before the suffix er, like merry, merrier, and before the plural ending es, like story, stories.

CHAPTER XVI

THE STUDY OF FOREIGN LANGUAGES

ENDS.—A foreign language may be studied as a means of communication, for the sake of the literature expressed in it, for the aid it may give to historical research, as an aid to the study of other languages, or for the sake of knowing its peculiarities of vocabulary and structure and its kinship with other languages, or it may be studied to serve several or all of these purposes at the same time.

STATUS OF LATIN AND GREEK.—With respect to present use languages are said to be either living or dead. Of the dead, or relatively dead, languages, Latin and Greek only are studied in our elementary or secondary schools; and of these, Greek is studied by a very small number of pupils. Latin, therefore, is the only dead language that need be considered here.

Several hundred years ago the Latin language and literature were the queen studies of the schools, and Greek was next in importance. Then, Latin was the language of the scholar, the churchman, and the diplomat, and every court in Europe had a Latin secretary. Then, too, nearly all literature of recognized excellence was either in the Greek or the Latin tongue. Since then such changes have taken place that the right of Latin to maintain itself by the side of the modern languages and sciences, must be vindicated by argument based on fact and sound logic. This is especially the case because in many instances the results of years of Latin study seem to be entirely too meagre for the time and effort expended.

REASONS GROWN INVALID.—If we retain Latin in our courses of study, we should have good reasons for doing so. There are such reasons, though some of those that formerly held good are no longer valid. Latin, for instance, except for some purposes in the Catholic church, is no longer a medium for social, business, or scientific communication. Neither are the literary masterpieces of Greece and Rome any longer to be considered models of

excellence for modern imitation. As the old literatures expressed the life that then was, so the modern nations are producing literatures that express the life that now is, both in their form and their content. New wine cannot be put into old bottles. The new point of view, the richer knowledge, the keener insight, the greater range of activity, the grander sweep of aspiration, and the more universal sympathy of the modern time, have given to its literatures elements of strength and beauty different from those of the ancient. Thus two powerful incentives to the study of Latin have passed away.

FAVORING ARGUMENTS.—(1) One argument in favor of the study of Latin is still forceful and will continue to be so for many a day to come. It is the possibility of mastering the noble body of literature that survived the dissolution of the old empire and the vicissitudes of the centuries that have since passed away. The finished and powerful orations of Cicero, the patriotic history of Livy, the stately verse of Virgil, and the genial songs of Horace, are worth all the effort it may cost to learn to read them. No translation, however skilful and sympathetic, can take the place of the originals. Neither a German nor a Frenchman of to-day can reveal to us his thought and feeling in all its fulness and inmost richness through an interpreter; much less so can this be done by a Roman of the olden time, whose environment and habits of thought were so radically different from ours. A very little study of other languages makes plain the fact that words in different languages that are apparently equivalent, after all are but approximately so, and that much of the peculiar force and beauty of words and phrases is felt rather than understood, and eludes all attempts at translation and explanation.

(2) The study of Latin is also a valuable aid to the study of Roman history. Because of Roman influence on modern civilization, this is no mean incentive to the mastery of both the language and the literature. From both may be learned something that historical records fail to communicate.

Language is the coinage of the brain and heart, and so the Latin tongue is the index of the Latin mind. The

language of a primitive people has a limited vocabulary and is crude in its organization. As peoples progress, the growth of institutions, multiplication of activities, and modifications of the national spirit are all reflected in the enlargement of their vocabulary and in the skill and refinement of their phraseology. So in a large way literature exposes to view the social and mental conditions that lead to the events recorded in history. In its structure and choice of theme, it reveals the national genius; and in its content, the status of the individual, the domestic and industrial life of the people, their virtues and vices, their tastes and ambitions, in fine, the subtler forces that direct the activities of men and of nations.

(3) Another argument in favor of the study of Latin lies in its relationship to modern languages. A knowledge of Latin makes the study of French, Italian, and Spanish comparatively easy, for these are its direct offspring. It is also a great help in the study and use of English. A remarkably large part of our common English vocabulary is either directly or indirectly of Latin origin, and the Latin roots brought with them into our language the significant Latin prefixes and endings. In most of the sciences the nomenclature is either almost or entirely Latin.

(4) For some there is a cogent reason for studying Latin in that it is an interesting and profitable field for research for any one who seeks knowledge of the growth and structure of language, of the laws that govern them, and of the marks of relationship among the Aryan tongues.

SUPPLEMENTARY REASONS.—Assuming that these are the leading reasons for continuing the study of Latin and that they are sufficient to justify it, it remains to be noted that two incidental reasons strongly argue in its favor.

(1) In the first place, Latin is radically different in structure from English, and expresses ideas hardly less so.

Our language is almost destitute of inflectional endings and formal agreements, is logical in the order of words, and is accentual in pronunciation. Latin, on the contrary, is highly inflected, has a complicated system

of agreements, has a formal structure of sentence, and, therefore, a very different word order, and is mainly quantitive in pronunciation. Then also because of different environment and different racial experiences, even when Roman ideas most closely resemble ours, they are really very different. In consequence of these facts, the effort at translation is not a merely mechanical memory exercise, and it becomes successful only through the constant use of careful reasoning and sound judgment. Neither the exact meaning of the passages nor the proper words to translate them could otherwise be discovered. Every sentence with its words strange in form and significant ending and almost equally strange in meaning, is a problem for solution requiring scarcely less strenuous effort than a problem in mathematics. Because this effort is connected with literary and historical training, the classical students in our institutions of learning show a thoroughness and solidity of mental power, a skill and finish in its exercise, and a breadth of intellectual sympathy that distinguishes them from other students.

(2) In the second place, the study of Latin is the best external help to the knowledge of English and to skill in its use, independent of the Latin origin of many words. The effort to find proper equivalents for the Latin words and phrases compels careful measure of English words and phrases and leads to the discovery of their exact value. The old Romans, too, did big things in a big way. Their writers and orators, therefore, wrote and talked of things that were worth while, and under the training of the Greeks they learned to do it well. So the translations of what they wrote by our pupils, if the teacher demands that they be idiomatic and at the same time true to the original, are composition exercises of a very high order.

THE METHOD.—The method of teaching Latin is primarily the method of translation. Latin cannot be taught like a living language, or at least not to most pupils as a living language, without too great a sacrifice of something more valuable. Few teachers know Latin well enough to teach it so, and there is not enough need of that sort of Latin either written or spoken to create an active demand for it.

NEED OF VOCABULARY.—The first thing to attend to in teaching Latin is the development of a good working vocabulary. This is true, whether the words are studied directly or through the medium of the sentence. It would seem unnecessary to mention this if it were not for the fact that so little attention is ordinarily given to it that Latin students generally make it up temporarily, that is, they give it only sufficient attention to carry them through the immediate lesson. As a result, most of the words are speedily forgotten and must be learned over time and again. This causes loss of time and patience and a weak grasp of meaning. A basic stock of words should be memorized thoroughly as early as possible.

SOUND VALUES.—The mastery of vocabulary involves the sound values of words and pronunciation. In this respect our Latin teaching has been very slovenly and defective. Much of the music, force, and meaning of a language is in its correct utterance. A systematic mispronunciation even of English makes it a barbarous jargon. The same is true of every other language. Scholars have worked so diligently and skilfully to discover the sound values of the Latin letters during the classic period, that we now can feel sure that they have been successful. We have the results of their investigations in the Roman method of pronunciation, now generally used in our schools. We are radically remiss in that we allow pupils to over-accentuate, to misplace accent because of attention to endings in learning declensions and conjugations, and frequently to disregard the quantity of letters and syllables altogether. This last is particularly a vicious mistake, in that it renders the easy, musical, and otherwise satisfactory reading, especially of poetry, well-nigh impossible. It is almost as easy to learn to pronounce Latin words with at least approximate correctness from the beginning as it is to learn to pronounce them incorrectly. Why not do it, and learn to give Latin an ear meaning as well as a sight meaning?

DECLENSION AND CONJUGATION.—Next after the vocabulary, in importance, is a knowledge of the modifications to which words are subjected in order to particularize their functions, a knowledge of the declensions,

comparisons, and conjugations. This knowledge must be connected with a mastery of the principal rules of syntax.

To make this knowledge of form and use reasonably complete and serviceable is not an easy matter. It requires more patient, persistent, and skilful written and oral drill than many teachers are willing or able to give. Beginners' Latin books help in the matter with the exercises connected with the grammar lessons, but even these must be supplemented with free exercises.

NOUN AND ADJECTIVE FORMS.—The basic knowledge of substantive and adjective forms is, of course, a knowledge of the declensions as wholes as they are given in the grammars. This knowledge puts the pupil in position to determine for himself the case value of any form whenever he is in doubt; but it must be remembered that skill in the use of separate case and gender forms in the two numbers comes by drill in such use rather than by running over whole declensions. After the lessons set down in the book have been gone over, a little while may be spent by the pupils in giving either orally or in writing the English equivalents of forms of Latin nouns or pronouns dictated freely by the teacher, or the Latin forms of English nouns and pronouns and of prepositional phrases containing them. Many similar drills with nouns and adjective modifiers are necessary to make the pupils familiar with the complicated system of adjective agreements, all the more complicated because the adjective may belong to one declension while the noun belongs to another.

CONJUGATION.—With verbs the case is at first a little different. It is desirable to present nouns, pronouns, and adjectives in sentences almost from the beginning. A few verb forms are needed to do this before it is wise to teach whole conjugations, but it is not wise to make the whole study of the verb fragmentary. The study of whole conjugations must not be too long deferred. With such study comes a certain facility in the learning of verb forms, a readiness in the recognition of their values, and a skill in the use of them that is otherwise more difficult of attainment.

It is a mistake to teach the different systems of con-

jugation too mechanically as distinct from one another. They are distinct only in a few essential and easily recognized features. In other respects they are alike. It is, therefore, desirable to teach as early as may be the principles of verb structure, the nature and value especially of personal endings and tense signs. What is eram in the verb laudaveram?

TRANSLATION INTO LATIN.—The most severe and effective drills in the use of word forms and the application of the rules of syntax consist in translation from English into Latin. Commencing with the translation of words and prepositional phrases in the lessons on the first declension, it should be continued until the pupils have mastered all the word forms and the different phases of sentence construction. This for the large majority of pupils is the purpose of the translation from English into Latin. Only the few who will have special use for Latin may profitably continue the study of Latin composition until they can use Latin freely and with good style.

NOTES ON FORM DRILL.—With respect to form drill a few suggestions may be helpful. When pupils begin the study of adjectives, it is advisable to have them frequently give the full declension of adjectives which they are called upon to parse, but after the declensions are well fixed, it is generally better to have them decline the adjective with its noun in both numbers. In parsing verbs, it is well at first to require the pupils to review all the steps helpful in locating verbs, the principal parts, the synopsis of the mood, and the conjugation of the tense.

Much of the form drill should be in writing, even if the class is small. The sight impressions help much to fix the forms definitely in mind.

It must always be borne in mind that the form drills are not ends in themselves. They are means to ends, and they should be so directed as to accomplish the ends in the shortest possible time and then discontinued except as occasional exercises to prevent lapses.

MEANING.—The first end of both form study and syntax is to render easy and sure the grasp of meaning.

If the teacher fails to bear this in mind he will not put forth the effort necessary to accomplish it and the pupils will carry from class little connected thought or information gained from the literature. The forms and constructions require of them so much attention and their knowledge of the environment that conditioned Roman thought and feeling is so limited that their knowledge at best is apt to be very scrappy and hazy. It is necessary to keep their minds alert for literary knowledge by means of proper questions and reviews, by requiring them to look up needed supplementary information, and by helping them to find it.

When reading Cæsar, pupils should study the geography of the country described, the organization, weapons, and methods of the Roman army, and Cæsar's political relations and ambitions. Their skill in drawing may be used to very practical advantage. Pictures of standards, armor, and weapons help to give reality to the legions and meaning to the accounts of their marches and battles, as also do maps and charts of their encampments, battle formations, fortifications, engines of war, and bridges.

The study of Cicero demands the supplementary study of many of the social and political conditions existing in his time and a definite knowledge of the Roman senate.

Supplementary Exercises.—For the sake of a more satisfactory knowledge of the literature as well as of a better practical knowledge of the language, pupils should at fairly regular intervals review consecutive portions of what they have read, reading them aloud in Latin and giving in their own language the substance of the passages so read.

Sight reading and translation of Latin within the range of their capacity is always a good exercise, and there is still another possibly more important, sight reading with interpretation instead of translation. To be effective this reading must be of literature much simpler in its language than that which they study for translation, literature like that in Jacobs' Latin Reader. It is a pity that there is not more of it done and that there is not more literature adapted to the purpose. This reading

increases familiarity with the common idioms of the language and cultivates what may be called the language feeling. It is surprising how much of the force and meaning of words makes itself felt through their recurrence in different combinations. In sight reading the pupils repeat only the substance of what they have read as they are able to grasp it. This reading adds materially to the limited quantity of literature which close study allows the pupils to get over.

Modern Languages

The modern languages usually studied in our schools are German and French. Through the influence of our new relations to Spanish-speaking countries, there is also in some sections the beginning of an interest in the study of Spanish. This is likely to increase and spread. With modern languages the case is not the same as with Latin and Greek. The translation method of studying them is defensible only when the available teachers are unable to speak the languages. It is, of course, better to learn to translate the rich and useful literature of France and Germany than not to study French and German at all. In every case, however, when the teachers have the mastery of the spoken language, the proper method of teaching it is the method of use. A class in German should be primarily a German class, and translation should be purely a supplementary exercise.

Reasons for Method.—(1) One very powerful reason for this is that one of the greatest incentives to the study of living languages is the possibility of attaining to the practical and profitable use of them. This possibility is scarcely within the scope of the translation method for several reasons.

One is that by the method of translation the foreign words and phrases are not directly associated with the ideas which they represent, but indirectly through the medium of the English equivalents. The word suggestions are, therefore, not rapid enough for use in speech or even for ease in writing. The pupil does not learn to think in the language.

Another is that the pupil is naturally introduced early

to the study of classic literature, to the vocabulary and phraseology of a highly cultivated style. This style is attained only by the specially gifted and trained among the native users of the language. It is, therefore, removed in many ways from the common use. Even where it is not, the progress of the pupils is so slow that even three or four years of study with the best effort yields but a limited vocabulary and phraseology. The elements of the language at command, even with much training in composition, are so limited in number as to defeat all attempts at the ready and proper use of the language. Nothing is more discouraging to the students of modern languages who have employed the method of translation than their utter helplessness when challenged to the practical use of them after much hard study.

(2) Another reason for learning a living language by use will be readily recognized by even a well-trained classical student. He never can entirely escape the feeling that something of the force and meaning of what he reads eludes his grasp because he cannot use the language himself and cannot hear it used by others. The best preparation for the appreciation of literature is familiarity with the vernacular language of the people to whom the literature belongs.

(3) Another reason for the study of a living language by use lies in the helps to such study, generally within the reach of the pupils. They are likely to have more or less opportunity to hear the language spoken outside of the schoolroom. In some sections of the country French is much used, and German may be heard almost everywhere. Of late years similar help can be found for the study of Italian and Spanish.

The literature at command is also much more abundant than that of the dead languages, and includes magazines and newspapers dealing with the same subjects as those of our own language.

There is further help for the pupils in that the modern foreign languages are very similar to their own in their construction, especially in their word order, and they express ideas, feelings, and conditions in physical and social environment by no means so radically different

from those with which they are familiar, as is the case with the ancient languages.

First Lessons.—To begin a modern language by the method of use, the lessons should simulate the language lessons of our primary schools. They should be lessons on birds and plants and other familiar objects, especially the objects of daily use and association.

Pupils readily become familiar with the forms and meanings of simple questions equivalent to the English questions, "What is this?" "What is that?" "What is this called?" "Is this large or small?" They also soon learn to formulate the proper answers under the guidance of the questions, and with the help of the teacher, who in the beginning must furnish the complete answers. Always, of course, the teacher must furnish the new words needed to complete the answer, and it may seem a ridiculous thing to ask the questions under the circumstances. Experience, however, proves that the expectant attention excited by the questions and the whole spirit of the exercise leads pupils to lay hold of the words supplied by the teacher with such eager and alert minds that they retain them well and rapidly acquire a working vocabulary.

After an object has been studied in the way described the pupils are ready to write a continuous description of it. They are prepared for this not only by the oral questions and answers, but also by having been aided to put down their answers correctly in writing after they were orally made in the progress of the lessons. Several copies of the written answers should be required every day, covering the work of the day before.

At first the continuous descriptions, if honestly made without reference to the previous written exercises, will be crude enough, but they improve with astonishing rapidity. In a little while the pupils can write brief and simple descriptions after a series of oral questions with a fair degree of accuracy.

Grammatical Forms.—If the teacher prepares his work well, he can so direct the exercises that he can gradually familiarize the pupils with the grammatical forms of a fairly large number of words in common use,

and with the fundamental principles of construction. A very few verb forms are needed at first. In a language like the German, the accusative forms should be introduced early in connection with the nominative, and the use of both forms continued until they are familiar in the three genders. After that the genitive forms may be introduced, followed by the dative. The method may be employed somewhat as follows: "Was ist das?" "Es ist der Hut." "Sehen Sie den Hut?" "Ja, ich sehe den Hut." The adjectives must be introduced very judiciously to avoid confusion, in such manner as to enable pupils to grasp the principles of adjective agreement as well as command of a number of modifiers.

When the pupils have mastered a usable elementary vocabulary they are ready not for a grammar, but for a simple reader.

The First Reading.—This first reader should be adapted to the attainments of the class in the language, and it should be used as nearly as possible like an English reader in an English class. The questions should be in the language of the book, as should also be the answers. The object of the questions should be to test the knowledge of the text, and at first they must vary from it in form as little as possible. The answers cannot be expected to be much more than repetitions of the text at first; but they will soon become fairly free, if the teacher skilfully changes the tense of the verbs and the person of the subject as opportunity offers.

A German sentence will illustrate well and afford a hint or two concerning the teaching. Let us suppose that the sentence, "Der Knabe sagte, 'Ich bin krank,'" occurs in the lesson. The question, "Wie war der Knabe?" makes a mechanical repetition impossible, and suggests the proper answer. The pronouns should be taught at first not so much as masculine, feminine, and neuter as words responding to nouns introduced by der, die, or das, or dieser, diese, or dieses. Now responding to "Der Knabe," we have "er" and the rest of the answer is in the question. The full answer is easily made, "Er war krank."

The Early Grammar Lessons.—As soon as the

pupils can read and answer with a fair degree of facility, they are ready to begin the study of grammar in order to extend their knowledge of forms and constructions and make it systematic. As they acquire their grammatical knowledge, they should apply it to the analysis and parsing of the text.

The teacher will find, however, if he is exacting, that this is not sufficient for thoroughness and accuracy. There is needed the supplementary translation of phrases and sentences from the language studied into English, and from English back into the language, precisely as in the study of Latin.

Special Notes.—The teacher will best show his faith in his method by the skill he employs in subordinating these supplementary exercises to his teaching by use, subjective teaching, as it is sometimes called, and by the length of time he can continue the reading of simple literature. The temptation always is to hurry on to the stately productions of the masters of literature and to subordinate the language sense to formal drill.

It is well to remember that even a mature person who begins a foreign language becomes in that language a child again in many respects. In his efforts to think in the language, as he must if he wishes to use it, his personality shrinks to the size of his mastery of words and idiomatic expressions. Unless he is favorably situated, he will require quite a while to grow familiar with the elemental vocabulary and idioms of the people. These he must have if he ever wishes to use the language well and appreciate its literature. The fundamental force and vigor of the greatest literature is in the vocabulary and idioms of the people.

Supplementary Exercises.—While the pupils are studying the literature selected for class use, they should be given access to supplementary reading matter and encouraged to make the largest possible use of it.

As in the study of English also, composition lessons should keep pace with the reading. When translations are made, they should be idiomatically correct and elegant. Declamations are helpful, and singing of songs aids pronunciation wonderfully and increases interest in the study.

CHAPTER XVII

PHYSICAL SCIENCE

DIVISIONS.—Physical science presents to the mind a wide and varied range of fact, interesting in beauty and usefulness, and challenges the mind to correspondingly varied, energetic, and ennobling activity. It naturally divides itself into three groups: (1) the science of matter and force, (2) biological science, and (3) the science of the larger organized masses of matter. To the first group belong the different departments of chemistry and physics; to the second, botany and zoölogy, including a number of special branches like entomology and ornithology; and to the third group belong geology, astronomy, and geography.

VALUE.—Physical science urges strong claims for the attention of the teacher.

(1) In the first place it increases the pleasure its students derive from their physical environment.

Nature is beautiful in the mass and in detail. There is a feast for the eye whether it turn to the earth below or to the sky above, whether it rove over field or forest, over mountain, lake, or river. Everywhere are objects in endless variety, all of them beautiful to look upon, many of them fragrant of odor and pleasant to the touch. In this lies much of the joy of living.

Science opens our eyes and attunes our ears. It reveals twenty flowers where one was seen before, and causes each one of the twenty to disclose beautiful elements of form and color undreamt of before. It fills the forests with new trees and new animals, the lakes and rivers with new fish, makes the sky brilliant with new stars and new constellations, and multiplies the songs of the birds.

(2) It adds to the beauty of form, color, sound, and odor, the appreciation of another type of beauty, the beauty of those relationships on which are based our ideas of system, law, and order.

In the discovery of the adaptation of each creature to its environment, of the harmonious arrangement of its parts and their coöperation in the performance of the functions of life, of the interdependence of soil, plants, animals, and men upon one another, in fact, of the marvellous unity of the universe, is a source of the highest possible enjoyment. To lead to this discovery is one of the special functions of science.

(3) A third useful service performed by science is the new and rigorous character it gives to the moral law by teaching the true nature of the functions of life and the true relation of effects to causes.

This is very important because there is so much in our ordinary conceptions of law, coupled with mistaken notions of pardon and forgiveness, that tends to make men lax where they should be rigid, weak where they should be strong.

(4) A fourth service that makes a strong claim for more intelligent and more general teaching of science is to be found in its contributions to industry.

One thing illustrates this well. Possibly every state in the Union as well as the national government issues books and pamphlets on plant culture and on entomology and ornithology as related to it. These publications are prepared by well-trained specialists and are based on the best theoretic knowledge and the most carefully-conducted practical experiments. These publications are the means of preventing much serious loss in the cultivation of fruits, grain, and vegetables, and of profitably varying and increasing our plant resources.

(5) The physical sciences have a peculiar value for intellectual discipline.

The elements of scientific method in their logical order are (1) observation or experiment, (2) induction, (3) deductive application, (4) verification by further observation or experiment. All these processes are shared with other sciences in some way and to some extent; but in no other studies is there such constant, varied, and insistent demand for observation and experiment, and in no other studies is induction so logically necessary and of such commanding importance. In

fact, it has been largely through the influence of the physical scientists that the inductive method has come to be so generally employed in sciences like psychology, ethics, and philology.

(6) The exacting methods of physical science further make for truthfulness and intellectual honesty.

Much untruthfulness is due to intellectual rather than moral deficiency.

The person who observes carelessly, cannot well separate the essential from the unessential, and does not understand logical relationships, must necessarily report inaccurately, and in future reproduction unconsciously substitutes one thing for another and makes unfounded additions.

(7) One more special value of training in physical science is that it enables the student to understand, at least in part, the evolution of life.

This places him in the best possible attitude towards theories of evolution, and helps him in his efforts to solve the deeper problems of history, morals, and religion.

Book Study of Natural Science.—A text-book on any one of the physical sciences cannot be anything but a guide to the real study of its phenomena. None of the values of scientific study can be derived from the mere memorizing of text-books. Mere text-book science is pseudo-science. Nothing could be more deluding in its results, nothing more perversive in the use of time and effort.

The only semblance of an excuse to offer for this fictitious scientific study is that scientific information is useful and necessary for the appreciation of scientific achievements. This excuse has little validity. He who has done no scientific work himself cannot appreciate the scientific work of others, and the information that is not supported by a sufficient range of experience is, at best, but vague and impractical. In all the sciences the training in the method of investigation and discovery is of more value than the information acquired, because it increases scientific interest and produces the power to secure new information as circumstances demand and opportunity offers. A little science work well done is

worth more than much matter superficially skimmed over.

THE PRINCIPLE APPLIED.—The theory of chemical constitution and the formulæ and descriptions of analyses are a meaningless jumble without laboratory work.

The book study of physics is almost equally lifeless and valueless. The very least the teacher of physics can do is to illustrate the text with carefully-conducted experiments. It the school cannot afford the apparatus for this, let the teacher make it himself, have the pupils make it, or drop the subject.

If there is sufficient apparatus at hand for illustration, then there is enough to enable each pupil to repeat at least a few of the experiments for himself, and to work out a few independent experimental problems. Pupils can easily be encouraged to make apparatus of their own. The manual training they now so commonly receive, helps much. An electrical machine made by a boy for himself and used by himself is infinitely more profitable than any amount of examination cram.

Similarly the geologic study that makes an open book of the neighborhood as far as its geologic structure is concerned, covers the rocks and soils of every section visited, with sensible questions, and prepares for the finding of intelligent and interesting answers to the questions, is more valuable than the study that spatters meaningless statements over the globe.

Biological Science

PHASES.—The work in biology consists in the study (1) of the forms and structure of plants and animals as organized growing beings, morphology; (2) of the functions of these parts as related to one another, physiology; (3) of the grouping of plants and animals according to their resemblances and differences of form and function, classification; (4) of their adaptation to environment, ecology; and (5) of the conditions that produce modifications of form and structure, a subject presenting problems interesting in themselves and throwing light on the evolution of organic life.

NATURE OF THE STUDY.—It is evident that morphology is primarily a matter of observation. Written descrip-

tions and even pictures can only guide and supplement it. Just as soon as they are made substitutes for observation, they divert attention from its proper objects and take the life out of the study. The same is true of both physiology and ecology.

Classification, to have real value, must be based on morphology and physiology. It is an important phase of biological study, not only because of its intellectual value, but also because it gives knowledge such a wide range of practical usefulness. The mere mechanical search for the scientific names of genera and species is an act of intellectual veneering of the thinnest sort.

HUMAN PHYSIOLOGY.—The study of human physiology is a special phase of biology. It demands a knowledge of anatomy sufficient to enable pupils to understand the wonderful mechanism of the body and those functions, the knowledge of which is necessary to right and happy living. The structure of the heart, the lungs, the brain, the bones and their joints, the ligaments, tendons, muscles, and nerves, can easily be made plain with animal parts and organs easily procured. To supplement the use of these, every school should have a papier-maché manikin, or, at least, one made of heavy paper or cardboard. Such work scarcely belongs to any grade below the seventh or eighth. In the lower grades hygienic instructions and directions should take the place of it.

NOTES ON METHOD.—The extent of biological study in elementary and secondary schools is limited. It must be mostly confined to the study of plants and animals representing the different departments of plant and animal life, selected with reference to the capacity and interest of pupils and convenience in securing specimens. The larger things appeal to pupils first, and are most easily understood by them in spite of their greater complexity. It is only by skilful leading that young people become expert in the use of the high-power microscope and are enabled to interpret the significance of the smaller things, to penetrate the inner mysteries of plant and animal growth.

Much of the work naturally consists in verifying by repetition the discoveries of fact and the generalizations

first made by others. As much as possible, however, both the book and the teacher should avoid telling what the pupil is to find and what conclusion to form. They should so direct both observation and experiment that they may be made in the spirit of inquiry and that the results may bring with them the satisfaction of discovery. Thus the work of verifying wakens the appetite for independent investigation and cultivates the ability to prosecute it successfully.

Nature Study

ENDS.—The proper introduction to the physical sciences is what is now commonly known as Nature Study, and Nature Study will never have definite or high educational value until it is so recognized. The purpose of Nature Study is to help elementary pupils to see and interpret, as such pupils may, the natural objects, animate and inanimate, which are about them; to teach them how to turn their knowledge of these things to practical account; to increase their enjoyment of the beauty which is in them and their respect and love for them; to fill their minds more with respect and devotion for the God who made them all; and to prepare them to pursue with greater zeal and intelligence the systematic science work of later years.

RELATION TO TEACHER.—Nature Study is persistently urging its way into all our elementary schools, and it will not be denied. Nothing better has happened for the teacher. It demands of him activity that increases his range of knowledge and interest, takes him out into the fresh air and sunlight of God, and so increases his health, vigor, and happiness, and creates a new bond of union and sympathy between him and his pupils.

THE TEACHER'S PREPARATION.—Every teacher of nature should, of course, have had thorough preliminary training in one or more of the sciences, but that is not absolutely necessary. Whether he has had it or not, he must do an immense amount of what may be the most enjoyable recreation work in order to meet the pupils on their own ground and give them sympathetic guid-

ance. He must learn to see what they can and should see, and learn to do what they can and should do. State and national geological reports, agricultural and biological bulletins of every sort, reports of scientific societies and college organizations, and a number of books specially written for the purpose make this easy.

WHAT CAN BE TAUGHT.—Something can be taught in every department of physical science. In mapping out a course the questions to ask are:

(1) What things are best adapted to the capacity and interest of the pupils?

(2) What are most useful for them to know?

(3) What are most convenient to present in the schoolroom?

(4) What are most convenient of access outside?

STUDY OF DOMESTIC ANIMALS.—It is easy for pupils to study the dog, the cat, the sheep, the horse, the cow, and pet rabbits and squirrels. They should be led to observe the habits of these more closely. They should be given free scope to tell what interests them in the animals belonging to their families and in their own pets. They should be guided to notice the peculiarities of structure that adapt them to their modes of life, as the eyes and whiskers of the cat, the feet of the dog, cat, horse, sheep, cow, rabbit, and squirrel, the legs of the rabbit, the movements of these animals, their jaws and teeth and the food they eat, their coats and the seasonal changes which take place in them.

THE STUDY OF BIRDS.—The study of birds should include their mode and rate of motion in the air and on the ground, their feeding, their peculiarities of shape, size, and color, their habits of nesting, the relation of these things to one another, and their migrations.

THE STUDY OF INSECTS.—The study of many insects is naturally interesting to children, and may be made to take a wide and useful range. It is easy with a very inexpensive equipment to help them study the life history of a number of flies, mosquitoes, butterflies, moths, and bees. They can learn many practical lessons with respect to the injuries insects may do, and the methods of preventing them; and with respect to their usefulness, if

their functions are beneficial. The study of their structure and coloring may always be made fascinating.

THE STUDY OF TOADS, FROGS, AND BATS.—Contrary to the natural repugnance to these animals, they are very useful, perfectly harmless, and easily handled. The only care necessary is to keep the fingers away from the teeth of the bats, which are very sharp, and to handle them gently. All these animals are easily tamed. The life history of toads and frogs is easily observed, and presents interesting lessons in protective coloring. A number of snakes are almost or quite as harmless, and may be studied with pleasure and profit.

THE STUDY OF FISH.—Fish may be kept in aquaria, and they furnish a number of interesting lessons.

THE STUDY OF PLANTS.—Whenever possible, gardens should be connected with the schools. Either there or at home, and in pots and boxes, pupils should be encouraged to raise flowering plants, vegetables, grains, and trees. Elementary pupils may do something in almost very department of plant study, and it seems wrong to defer to the secondary period that which can be done just as easily in the lower grades and will add so much to the interest and happiness of child life.

Children see with delight the opening of seed coats, the lengthening of radicles, the growth of roots, the expanding of leaves, the appearance of buds, and the opening of flowers. The study of these things is basic. Starting with it, many facts in the morphology of parts of plants may be taught, many facts connected with the distribution of seeds by wind, water, birds, and animals, and by rolling, many facts in the physiology of plants, and much with respect to the relation of plant life to sunlight, air, moisture, soil, and insects.

The children should be taught to recognize the different grains and grasses raised in the neighborhood, the common varieties of fruit, and the common forest trees.

THE OTHER SCIENCES.—In the upper grades of the elementary school, the pupils may also learn a number of interesting facts in geology, physics, and even chemistry, by observation and experiment.

HINTS FOR ORGANIZING COURSES OF STUDY.—Each

school must make its own course of study with reference to the grade of pupils, the seasons, and the resources of the neighborhood. The winter months are the most difficult to provide for, but even then there is the snow and ice, the buds on the trees, the evergreens, a number of winter birds, the winter condition of insects, the plants that may be raised in the room, the evaporation of water, and its spread by capillary attraction. There is also the study of the plants and animals beyond the reach of the pupils by means of description, charts, and pictures. This is a convenient resource at any time when the weather interrupts outdoor study.

A Few General Principles of Method.—More than in the science work of the secondary school, the work of the Nature Study class should be a matter of personal investigation and discovery. Oral and printed descriptions of objects within reach are entirely out of order. Explanations by the teacher should be reduced to a minimum, suggested by necessity and the eager demands of the pupils. The teacher should tell the pupils what to do and direct attention in observation by means of suggestive questions and statements. What the pupils fail to discover with this help should be allowed to pass until they have increased ability. Reading exercises pertaining to the subjects studied should be incidental and supplementary.

Every season's work should follow a general plan, so that by its end there may be accomplished a fairly definite series of related results, but the system should not be forced on the attention of the pupils, nor should they be held too strictly to it. The teacher, not being bound by a text-book, may meet the pupils on their own ground.

Learn from the children themselves how to be free in these exercises. Their instincts take them into fields and woods and to the side of running streams and placid ponds. They learn something of many things, but never all about anything. Their nature requires this to be so. They notice the brilliant color of a flower and turn from it to the whir of the wings of the humming-bird that hovers over it; they turn their eyes from the glint of the scales of a fish that flashes in the sunlight to the

steady patience of the heron as he waits by the side of the brook to feed on the fish. In this rich variety of claim upon attention lies much of the happiness of childhood and the hope of future intellectual wealth. By taking advantage of the happy curiosity of the boys and girls, the teacher may gradually convert it into the patient, concentrated ambition of the scientist.

The nature knowledge gained in such a fresh, interesting manner furnishes the very best material for training in language, drawing, and coloring. With rapt enthusiasm the pupils tell of the last butterfly they have discovered, describe its form and color, and with equal enthusiasm they reproduce it on paper with pencil and paint. This is work that counts. It inspires the pupils to greater effort, and delights both teacher and parent.

Suggestive Directions for Nature Study

The field of Nature Study is very large. In a work as brief as this there is little opportunity for detailed direction. Some, however, is desirable. What is given must be regarded as suggestive.

DANDELION SEEDS.—Nearly all children have at some time taken pleasure in blowing dandelion seeds off the head. Without instruction few of them know that it is seed furnished with a means of easy distribution. What attracts them is the roundness of the head, the down attached to the seeds, and the lightness with which they float in the air. It is easy to tell them that the little lump is seed, the down attached to it, its means of floating in the air, and the wind the agent that carries it away to drop it somewhere on the ground, but that is not good teaching.

Here is something better. Have one or more in the class blow some of the seed over a box of earth kept in the window where the sunlight may fall upon it, and have the whole class note the results in the days that follow. While these are developing, have the pupils note what is happening to the dandelion heads in neighboring grounds. In a little while they will have learned all the essential facts with the help of a very little questioning or explanation. Possibly none of the latter may be neces-

sary. A neat account of what has been learned completes the lesson.

A Lesson on Nuts.—When walnuts and hickory nuts are ripe, have the pupils find trees of these kinds on a hillside and near a small stream if possible. Have them measure the greatest distance from the trees at which they find nuts on the ground and in the water. Ask how they get there, and why.

Beans.—Have the pupils plant a few lima beans at one end of a box of earth, and then in a series a few more each day for five or six days. When the second set of leaves are fairly developed on the plants growing from the first beans, have a few stalks of each day's planting taken out and placed side by side in order with a few beans stripped of their covers after soaking them in water. This will clearly reveal the early life history of the bean stalk. If the box in which the beans are planted has glass sides, the observation of growth will be much aided. Colored drawings of the beans and stalks in the different stages of development will fix attention on the two kinds of leaves and otherwise add to the effectiveness of the lesson.

Melon Seeds and Corn.—Let the pupils plant watermelon and squash seeds and corn in the same way. The difference between the monocotyledonous and dicotyledonous seeds will appear. The technical names need not be taught. Comparison of the thickness of the bean and melon cotyledons when they are fairly lifted in the air, with cotyledons taken out of seeds unsprouted, and of a kernel of corn not planted with another whose first blade has forced its way into the air, may lead to the discovery of the first food supply of these plants.

If this is done in the fall when acorns are ripe, new lessons may be added. The acorns will sprout if lightly covered with earth and kept moist in the sunlight. The cotyledons of the acorns, unlifted in the air, remain white, while those of the bean and the melon become green. Is it the light or the air that works the change? The pupils will discover the answer to the question by shutting the light from some of the bean and melon

plants when they begin to push through the soil by spreading paper above in such way as not to exclude the air.

WINTER BUDS.—Balsam or other large buds furnish excellent lessons. The facts to be noted are the conical shape, which does not permit water to accumulate and freeze, the covering of hard scales, the smooth varnish-like coating, the soft woolly coats inside, all protective in character, and last the miniature leaves for the next summer's growth, ready to burst forth as if by magic when warmed by the sun of spring.

BUDS IN SPRING.—In the spring our common fruit trees offer plain lessons in leaf and flower buds. If twigs of apple, peach, and cherry trees are placed in jars of water as early as March, their buds will swell so as to reveal their character plainly. Leaf buds are slender and conical, while flower buds are short and plump. When the buds have swelled, the pupils may open some of the slender ones and discover the tiny leaves. When they open the plump ones, they will find a cluster of knobs instead.

Have the pupils mark what they assume to be flower buds and leaf buds on convenient trees in the neighborhood by tying threads of different colors about them before they open, and see later what develops from them.

In the same way they may mark terminal and lateral buds and note how they add to the growth of the tree, each kind in its own way.

If opportunity offers, practical lessons in budding and grafting should be given.

FOREST TREES.—Children should early learn to recognize the common forest trees by leaf, bark, and wood, and their industrial values as well. If the teacher will provide a cabinet for suitable sections of wood and bark, he will be surprised at the readiness with which the proper sections will be supplied by his young naturalists. They may be taught to mount leaves of different kinds on cards to form ornamental figures that may be used for decorative designs in drawing. Very neat and instructive cards may be formed by gluing to cardboard a leaf or two, a slice of wood, a piece of bark, some of the blossoms, and

a fruit from the same trees, to illustrate the different species.

Related Insect Lessons.—There is a close relationship between plant life and insect life, and many lessons on insects may be connected with plant study. Pupils quite young may learn the functions of parts of flowers. They may be told that the young seeds (ovaries) do not become real seeds that can grow unless some pollen enters them. They can also learn by direct observation that some flowers are pistillate only and some staminate only, while others are both. They will thus be prepared to learn something of the services that insects perform in fertilizing and cross-fertilizing plants.

If a honey bee or a bumblebee is found in a cup-shaped flower, it may be captured by closing the top of the flower and then released under a tumbler for observation. The pollen on its legs will help to tell the story of its business, and also explain something of the value of flower colors.

In the springtime red clover may be grown in a little patch of the school ground and some of it covered with a netting so as to exclude the bumblebees, while the other plants are allowed to be free. The pupils will be able to note the result on flowers and seed before the term is over.

Special attention should also be given to the life histories of insects injurious to plant life. This has practical value, as it may be made the means of teaching the methods of destroying such insects and will prepare the pupils to understand the services of many birds.

Butterflies and Moths.—Nothing delights children more than to capture butterflies and moths. They are attracted by the activity of these insects and by their beautiful forms and brilliant colors. Pupils may be taught to make nets, capture specimens, kill them in a wide-mouthed bottle containing a little cyanide of potassium, and prepare them properly for preservation. If nothing more followed than the study of the characteristics of form, the number and setting of the organs, and the distinctive color features, the work would be valuable, but much more can be done. The pupils can collect eggs, chrysalids, and cocoons, and study the life histories of

these creatures. Specimens of whole series may be kept in boxes with glass tops and bottoms, fastened to the bottom with small drops of glue. The boxes are easily made by gluing strips of wood taken from cigar boxes along the edges of the bottom glass and, after the specimens are fastened, fixing on the top glass by gluing strips of paper over the connecting edges.

AQUARIA AND BREEDING BOXES.—Every school should have several boxes made of panes of glass cemented into tin frames. These can be made by a tinsmith, and will cost but little. The cement can be made of eight parts, by weight, of dry whiting, one part red lead, and one part litharge, mixed with sufficient linseed oil to give it the consistency of putty. Boxes, ten by twelve inches, and six inches high, are convenient and cheap. Covers can be made of wire netting fastened to wooden frames. Partly filled with water, these boxes can be used as aquaria for fish, frogs, and toads, and breeding places for mosquitoes, dragon flies, and other creatures that breed in water; and without the water, they can be used as hatcheries for flies, butterflies, moths, and other insects.

Teachers who lack the scientific training necessary to enable them to search successfully for the eggs, chrysalids, and cocoons of insects, should purchase or have in their school libraries guides like Miss Cragin's "Our Insect Friends and Foes," Weed's "Life Histories of American Insects," Saunders' "Insects Injurious to Fruits," and Miss Treat's "Injurious Insects of the Farm and Garden."

It is remarkable how easy the use of these aquaria and vivaria becomes with a little practice, and how fascinating the work is for both teacher and pupils.

A FEW SUGGESTIVE DIRECTIONS.—A little diligent search in September among the leaves of spice bushes and sassafras will lead to the discovery of fairly large, bluish-green worms, as they are commonly called, with red knobs on two of the front segments. These larvæ are themselves objects of beauty after the first feeling of repulsion has passed away. If the twigs on which they are found are cut away and placed in a vivarium with sassafras and wild cherry leaves for the food of the handsome

captives, they will after a while be seen weaving silken coats about themselves, cocoons. After a time, if kept in a warm room, the cocoons will show signs of life and from each one will issue forth a handsome moth. This new birth can be deferred by keeping the vivarium in a cool place.

Search under the bark scales of apple trees will reveal any number of cocoons of coddling moths, and their life history may be studied in a similar way and with profit.

A small piece of meat left in an open vivarium, exposed to the outer air in the sunlight, will soon attract flies that will deposit their eggs upon it. In a little while the whole life history of the fly will be unfolded.

If two or three inches of moist earth are placed on the bottom of a vivarium and a few sticks and dead leaves scattered about on it, a toad may be placed on the ground. It will teach many lessons. The protective character of its color will be seen, it will burrow in the ground, and, if they are furnished by the pupils, it will devour an astonishing number of caterpillars, flies, beetles, spiders, roaches, and bugs of every sort, and will prove what a useful creature it really is.

In the spring, a few inches of water may be substituted for the ground. A bottom sloping to the surface may be built of pebbles at one end, and water plants be placed in the water to keep it oxygenated. It will then be an aquarium ready for the hatching of toad eggs. The eggs will be found in abundance in any pond. They are found in strings on the surface of the water. When placed in the aquarium in a warm part of the room, they will be hatched and pass through all the stages of growth from the tiny tadpole to the fully formed toad in a few weeks.

The development of the frog may be studied in the same way.

Bird Study.—Ordinarily nothing in Nature Study is more interesting than the study of birds, and bird knowledge has much economic value. The country has suffered much from the destruction of useful birds, most of which may be charged to ignorance. When the attractiveness and value of the study are considered, it reflects little

credit upon the teaching profession that so many pupils leave school unable to tell a hawk from a heron.

Birds appeal to the interest of pupils in many ways. Neither insects nor flowers are more exquisitely beautiful of form. They are miniature, gracefully keeled ships of the air. They are smooth and soft of plumage, and many are as brilliant of color as the richest blossoms of the garden. Then there is wonderful movement. The very poetry of motion may be seen in the flight of hawk and swallow. The life history of birds is tinged with romance. Their migrations to and from the sunny southland, the mating, the skilful architecture and concealment of the nest, and the care of the young, all have a peculiar charm; and as choristers of field and forest, birds make nature rich in melody.

The Feathers.—Even a feather is interesting to study. Take a quill feather from the wing of a crow and see how many lessons are offered by quill, and shaft, and web. How strong and firm the web is in spite of its lightness and apparent frailty, because of the way its barbs are held by barbicel and hooklet, and how thorough and effective are the provisions to keep it and all the rest of the plumage glossy, smooth, and water-proof!

Knowing the Birds.—The pupils in the elementary schools should learn to know at least all the common birds that breed in their vicinity. This means much more than to know their sizes and colors. Size and color are but incidental guides to the recognition of species. An eagle is as truly a hawk as a sparrow-hawk in spite of the great difference in size, and a night-hawk is not a hawk at all. The crow and the jay are very closely related, yet the one is uniformly black, while the other is one of the handsomest of our forest dandies. In a number of species the males and females are radically divergent in color.

To know birds in a useful way is to know the functions they perform, their manner of performing them, and their adaptation to both function and manner in structure and color.

Color Values.—Studied from this standpoint, color is more than a quality pleasing to the eye. It is one of the mysteries of the evolution of life, a feature in the provi-

dence of nature. When male and female differ in color, usually the brighter color is the courting garb of the male, his means, coupled with his more melodious voice, of attracting the female. Her more modest attire and more quiet voice are means of protection to her when engaged in domestic duties.

This protection of color is common among birds. It belongs to the young of many species, to birds limited in flight, like quail and grouse, and to birds sluggish while at rest, like the night-hawk. In some species color serves both for protection and as an aid in the securing of food. This is the case with some of the herons. Their colors while standing motionless among the grasses in shallow water leave their victims unsuspicious. To discover these things is a never-failing source of pleasure.

Method of Study.—The proper way to study birds is to go and meet them where they live or to attract them with kindly treatment. Many details of structure and even of color, however, thus remain unseen unless the observer is fortunate enough to have the use of a field glass or a good opera glass. It is well, therefore, to study such caged birds as are within reach and to take advantage of all the freshly killed specimens that chance may bring to hand. It would be well if every school had a collection of carefully mounted specimens to supplement field study. The number of birds accidentally killed in a locality or killed by thoughtless neighbors is large enough to be of considerable help.

Suggestions for Field Study.—Suppose the interest of a class to be aroused by the first flight of snowbirds from the north in the fall. Let the teacher ask the pupils to note how these birds feed, how they progress on the ground, how they fly, where they spend most of their time, in the air, on bushes or trees, or on the ground, what the size and shape of their bills are, what the length of their wings, and what other birds they most resemble. With the help of canaries and English sparrows the features of their structure may be made very plain, and a few suggestive questions will enable the pupils to see the relation of these to the activities of the birds they have observed.

Connection with Insect Study.—While studying flies, the pupils may be directed to observe the flight of swallows and swifts. They should note the localities of the flights, the height in clear and in cloudy weather, the rate and duration, and the peculiar variations of direction. This observation prepares the pupils to learn what these birds feed upon. This they cannot see. It also prepares them to appreciate the value of the long flat wings, and of the wide-gaping but small-billed mouth. The swifts add the interesting feature of shortened tail feathers with shafts extended beyond the webs as strong, sharp spines. These aid the birds in clinging to the sides of the chimneys in which they sleep. Their tiny legs and feet and almost needle-pointed claws are also interesting. Closely related to the chimney swifts are the night-hawks and whippoorwills.

Another group of birds is likewise interesting because its members capture their food in the air. It consists of those species that feed on flies, mosquitoes, and other troublesome insects, after the manner of the pee-wee, or Phoebe bird, whose cheerful voice is so welcome in the early spring. He perches on a post, branch, or wash line, teetering his tail feathers assiduously, and frequently darts four or five feet from his perch to return to it quickly. If the observer is near enough, he will hear a snap of the bill at the end of the outward flight. Sometimes the bird will change his flight with sudden turns. Then there will be a snap of the bill at every one of them, two or three in succession. Each snap marks the death of an insect.

In structure these birds differ much from the swallows, but they are just as well adapted to their business. Their wings are not so long and flat. Their bills are longer, but they are wide at the base, the upper mandible curves over the end of the lower, and bristles project from the head on both sides of the bill in such way as to throw towards the mouth any insect the bill might miss.

The study of moths and other insects injurious to fruit may lead to the observation of the activity of the woodpeckers in neighboring orchards and groves. Many empty cocoons may be found under the bark scales where

the woodpeckers have been busy, and holes may sometimes be found in the wood out of which they have dug grubs. Perhaps on the same trees their housekeeping will be discovered. These things will give meaning to their stout chisel-shaped bills, their relatively large and heavy skulls, their long slender tongues barbed at the end, and to their strong, pointed tail feathers.

The Hawks.—In almost any country neighborhood the killing of a hawk is a common occurrence. It is generally easy for the teacher to get the birds killed if it is known that he is interested in them. He will find that each one will furnish interesting lessons that will help young people to appreciate the useful services rendered by most of the species.

So much could be said on the subject that it is almost impossible to stop, but the limit of space forbids saying more. The best thing to say in conclusion is that every fact in nature discovered by a pupil under the guidance of the teacher, leads to the independent discovery of a dozen more just as interesting and useful.

CHAPTER XVIII

PHYSICAL SCIENCE (Continued)

Geography

INTRODUCTION.—We come but slowly to concede to Geography the status of a distinct science, and find it difficult to define, even approximately, its limitations. It is still common to speak of geography as "a collection of facts and principles drawn from other sciences." This is because the geographer deals with objects that belong to fields claimed by other scientists, botanists, geologists, astronomers, and the like, and in spite of the fact that he does not deal with them in the same way. The study of plants does not necessarily make a man a botanist, nor does the study of rocks necessarily make him a geologist. The fact is that the same objects and phenomena may be observed from different viewpoints, with wide differences of purpose and method, and with very different results. It is difference of purpose and method that separates geography from the kindred sciences, and gives it an interest and dignity peculiar to itself.

A GEOGRAPHIC DESCRIPTION OF KANSAS.—A brief review of the geographic features of Kansas may make the subject plainer. Kansas is geographically one of the simplest of all our states. It lies between the 37th and 40th degrees of north latitude. It extends from 94½ degrees of west longitude to 102 degrees west. The eastern border of the state is from 750 to 800 feet above sea-level, and the country gradually ascends toward the west until, at the western border, it reaches an elevation of 4000 feet.

For purposes of description the state may be divided into three fairly equal sections, an eastern, central, and western. In each section there are areas so broken or so thin of soil that they are not well adapted to farming. Generally, however, throughout the state the soil is deep and fertile. In the eastern section the annual rainfall varies from thirty to forty inches; over most of the cen-

tral section, it varies from twenty to thirty inches; and over much of the western section, from ten to twenty.

In the eastern section are grown abundant crops of corn, wheat, and oats; in the central section, the crops of wheat, corn, and oats are enormous; in the western section, the raising of crops on other than irrigated lands is a very discouraging business. In eastern Kansas, a tall wild grass, called blue stem, has taken the place of the original wild grasses, which were short, and clover and timothy can be cultivated successfully. In central Kansas, the original wild grasses have to some extent maintained themselves, while the efforts to cultivate clover and timothy are not encouragingly successful. Alfalfa, however, grows there luxuriantly. In the west, the blue stem and cultivated grasses yield entirely to mesquite, buffalo and bunch grass. These latter grasses cure on the ground and are seldom covered with snow. Here grazing naturally takes the place of grain farming.

Now, is the uneven distribution of rainfall accidental? Certainly not. Increasing elevation and distance from the Gulf of Mexico, the main source of supply, plainly account for it. Just as plainly the variation in the quantity of rain is the main factor determining the agricultural activity of the different sections of the state, and the degree of its success or failure. Even the excess of wheat production over corn in central Kansas in contrast with excess of corn in the eastern portion, is due to the fact that in the central section droughts are apt to begin before the corn has matured. Many farmers, therefore, rather raise wheat than risk the loss of a corn crop.

Again, in eastern Kansas there is considerable timber, in central Kansas there is little that can be used for manufacturing purposes, while in western Kansas there is practically no timber at all. So there are also in the east large deposits of coal, zinc, and lead. In that portion a large number of people are engaged in mining and manufacturing. In the central portion a number of people find employment through its large salt deposits. Is it not natural that the towns and cities of the eastern section are more numerous and populous than those of central Kansas, and that those in the west are small and far apart?

Is it not just as natural that there are marked differences to be noted in the employments of the people in these towns and cities? In other words, is not the population of the state distributed and employed according to the natural resources of the state as these are known.

But while this definable inter-relationship among the features of the state forms a proper basis to a claim that geography is a science, is it not, after all, true that it is made up of fragments of other sciences? Kansas has grasses, coal, zinc, lead, and limestone. Does not the study of these things belong to botany, mineralogy, and geology? Certainly some phases of the study of them belong to the sciences named, but not those indicated in our account of Kansas. A botanist new to the country would analyze the grasses to determine the genera and species to which they belong, and might observe them also to discover new light on the genesis of plant life. So the geologist would try to learn the exact nature of the minerals and the character of the deposits which they form, in order to know their relation to the history of the developing crust of the earth. Now the geographer is primarily not concerned in the questions of either the botanist or the geologist. He is interested in plants and minerals, and the facts of other sciences, only as they contribute to the configuration and appearance of the earth's surface and are factors in the economy of animal and, more especially, of human life. He deals with them in the mass. Geography is the science of the earth's surface as the home of man.

The Content of Geography

It is very important that the teacher of geography map out his work definitely. This is a difficult thing to do. The subject is large and richly varied in content, and its treatment is much hampered by traditions not well founded in wisdom.

General View of the Earth's Surface.—All the geographers tell us that the earth is an oblate spheroid, a little less than eight thousand miles in diameter. Surrounding the north polar region are two great land masses

extending divergently southward. On one side is Eurasia with the Australian extension on the east and the African extension on the west. On the other side is North America with South America as a southern extension.

Surrounding the south polar region is a great body of water extending northward between the great land masses in three great divisions. Scattered about in these bodies of water are numerous islands of different sizes, some entirely separate from, others very closely connected with, the larger land masses.

Variously grouped and distributed upon the surface of the land masses are also bodies of water smaller than the oceans and streams of water, both of which perform certain important functions.

It is these bodies of water and a thin upper crust of these land masses as the seat and condition to the interrelated phenomena of the plant, animal, and human life existing there, that geography selects for a special field of interest and investigation, including also such phenomena of the earth's interior, the air, and a few heavenly bodies in as far as they act upon the earth's surface and modify the phenomena there occurring.

THE LAND.—It is convenient to regard all the land masses as distributed among the great waters of the earth. They vary in extent and in location with reference to the equator and the poles and to one another. This location must have its final and perfected definition in terms of latitude and longitude.

Each land mass has its distinctive features of outline and relief, and these are of the first importance. Besides producing other results, elevation has the same influence on the climate and on animal and vegetable life as distance from the equator. The continental lands have each a region of primary high relief and one or more regions of secondary high relief, and, alternating with these, more or less extensive areas of low relief. The regions of high relief consist of single or parallel mountain ranges with lateral and connecting spurs, foot-hills, peaks, and plateaus. Among these mountains are longitudinal valleys and transverse depressions, which serve as passes for human and animal life and the flow of rivers. They con-

tribute much to the distribution of plant life. The areas of low relief are also broken by rises of land that divide rivers and river systems.

The land surfaces are made up of different kinds of rocks and minerals variously distributed, and of deposits of soil varying much in character, depth, and extent.

WATERS OF THE LAND.—The waters of the land masses are either gathered in depressions, forming lakes, seep through the soil, or flow along either as surface or under-surface streams. The lakes generally form more or less definite groups. The streams also form systems and series of systems. These depend for their size upon the amount of rainfall and the extent of territory which they drain; for the direction of their flow, upon the slope of the land; and for the rate of flow, upon the degree of its pitch.

THE EARTH STILL IN THE MAKING.—The features of land and water are not fixed and unchangeable. Portions of the continents are slowly subsiding while others are gradually rising, modifying thus both outline and relief, the flow of streams, the character of lakes, and the distribution of soils. Rocks exposed to the action of air and water rot and disintegrate, and wind and water transport the fragments. So the highlands are constantly growing less in height and changing their shapes, while the soils of the lowlands are increased in volume and extended, and the shore lines still further modified. Volcanic action and earthquakes also work many changes.

THE FUNCTIONS AND CHANGES OF STREAMS.—The streams have important functions to perform. They irrigate their banks and are the channels of escape for surplus water. In their flow they carry from the highlands soils and larger fragments of rocks, and they constantly wear their banks. They widen and deepen the outlets of lakes and choke up the inlets with the sediment which they deposit where the lake waters check their flow. So they tend to lessen the size of lakes and destroy them. In the floods they distribute new soil over the lowlands, and at their mouths they constantly deposit sediment. In this way they have contributed whole states and countries to the habitable earth. In doing this work they change their own character. They widen their channels at some places

and deepen them at others. They undermine and wash away their banks here and fill them up there. At times they shift their channels entirely. In so doing they may make cut-offs that shorten their courses, and may attack and destroy the very flood plains they have created. They pass from a dashing, vigorous youth, to a placid old age.

LIGHT AND HEAT.—Nearly all the light and heat that comes to land and sea has its source in the sun. The more direct the rays, the more brilliant the light and, other things being equal, the more intense the heat. With increase of obliquity comes a lessening of both.

Because the axis of the earth is inclined to the plane of its orbit at an angle of twenty-three and one-half degrees, during one part of the year, as the earth revolves around the sun, the region lighted and heated by direct rays recedes further and further southward from the equator, until the line from the sun's centre to the centre of the earth in the latter's rotation describes a circle twenty-three and one-half degrees south of the equator; and the northern limit of the rays is approximately twenty-three and one-half degrees short of the pole, while southward they extend the same distance beyond. The days grow correspondingly shorter northward and longer southward. The heat changes are still more marked because of the lessened period of heating in the north and the increased period in the south.

In the next half of the year the process is reversed.

The consequence of all this is marked seasonal changes, five well-defined light zones, two polar, an equatorial, and one between each polar and the equatorial zone, and five temperature zones that correspond to but do not exactly coincide with the light zones, as many conditions modify the heating effects of the sun.

TEMPERATURE CONDITIONS.—Water heats more slowly than land and more slowly radiates its heat. It is principally by radiation that the atmosphere is heated. Temperature, therefore, changes more slowly over large bodies of water than over land, and important results follow.

The denser strata of air are low. Now, the denser the air, the greater its capacity for heat. In consequence, elevation has an effect similar to latitude, temperature

growing lower with height as it does with approach to the poles.

Difference in precipitation of moisture also modifies temperature, because evaporation and the melting of snow and ice consume heat.

Differences of temperature are, therefore, due mainly to difference in latitude, to the inclination of the earth's axis, to difference in distance from large bodies of water, to difference in elevation, and to difference in melting and evaporation.

RESULTS OF TEMPERATURE VARIATION.—One important result of variation of temperature is the creation and modification of winds, for winds convey moisture from the source of supply and distribute it. Much depends on this distribution, and it is very uneven and irregular. The wind from a waterless district is dry, while that from a region of copious evaporation is richly saturated.

A fact to be clearly held in mind is that lowering the temperature of air lessens its capacity for moisture, and, if continued beyond a certain point, causes condensation and precipitation in the form of snow, sleet, hail, or rain. Generally moisture-laden winds from the south moisten the earth as they proceed northward and make it fertile and beautiful. So saturated air turned upward by high slopes also parts with its treasures of water, and the lands behind the slope, unless more favored from the other side, remain dry and barren. Thus the Great Interior Basin of the United States is robbed on the east and on the west.

Uneven heating is also directly or indirectly responsible for the currents in the ocean. These are due mainly to winds and difference in specific gravity. Because sea water is salt, lowering of temperature and increase of evaporation make greater its specific gravity, while abundant rains, the inflow of large rivers, and the increase of heat lessen it, and always the heavier waters flow towards the lighter and the lighter in turn towards the heavier by way of compensation.

In regions where winds blow with persistent steadiness in one direction, the waters are driven before them.

These streams of the ocean in turn modify temperature and rainfall and produce other results as well. So the Gulf Stream aids the wind to keep the United Kingdom free from ice and make its climate comfortable, while currents from the north laden with ice chill the airs that blow over Labrador and contribute to its bleak inhospitality.

Combined Effects on Vegetation.—Rainfall, temperature, and the depth and character of the soil determine the luxuriance or scarcity and the character of vegetable growth, and condition its distribution. Distribution is promoted by the adaptation of plant life to spreading growth, the agency of wind and water, and the activity of animals and men.

The character and relative abundance of plant life determine the number and distribution of land animals; and upon plant and animal life together more than on anything else, depend the number, occupations, and distribution of the human race, for the primary need of man is something to eat.

A large part of the world's history could be written on the basis of its food supply. Every student of general history knows that the fertility of the flood plain of the Nile made possible the ancient civilization of Egypt. The destiny of the human race has been much modified by the fact that while Arabia has possessed the conditions favorable to the multiplication of population, it has not been so successful in feeding them, because of the large areas of land either quite barren or low in productive capacity. Through the centuries there have in consequence been periodic overflows of population like that which flooded the valley of the Tigris and Euphrates with Shemites and that which sent a great tidal wave of Mohammedan invaders into the heart of France in the eighth century.

Other Influences on Population.—The supply of food as a factor in determining the density and occupation of population is supplemented by other natural resources, such as timber, rocks, and minerals. Because of its mines and manufactures, England has a population much larger than can be fed with home-grown products, and there are mining districts in the United States whose people are fed

almost entirely with imported foodstuffs. So there enters another factor into the problem of human life as the geographer sees it, that of transportation.

THE STATE OF CIVILIZATION.—Upon the extent and the natural resources of a country, upon its relative ease of communication with others and transportation of raw materials and manufactured goods, are based the possibilities of a people's progress in civilization. That means the development of manufactures, the arts, and inventive genius; the increase of wealth and comfort; and general advancement in intellectual and moral culture.

The Esquimaux of the North, dependent almost entirely upon the sparse animal life of the sea and land about them, are doomed to remain few in number and almost isolated from the rest of the world. They have nothing to sell and are, therefore, unable to buy, and communication with the rest of the world is difficult. They accordingly retain a primitive social life with a corresponding system of morals, and their mental development in many respects is child-like. For opposite reasons Europeans and Americans have long led the race in the achievements of civilization.

The African lags behind the European not so much because of the color of his skin as because Africa is not so rich in navigable rivers and sheltered bays, nor in lands so fertile and so cheerful to dwell in.

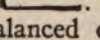
POLITICAL DIVISIONS.—The peoples of the earth are more or less compactly grouped together in political divisions. These it is interesting and important to know. They owe their existence to historic movements and development, but these again become intelligible only through conditions of soil, climate, natural supplies, and communication.

DIVISIONS OF WORK.—The above is a brief and coarse outline of the work to be done. It is evident that geographic material appeals first to the senses, next to the imaginative power, and lastly to the power of reason. The possibility of successful appeal to the imagination and reason depends upon the intelligence, breadth, and thoroughness of observational experience. "The things that are not seen" must be learned "through the things that are seen."

Observational Geography

APPLICATION OF TERM.—The term observational geography means more than the making of mimic rivers and islands and lakes and bays and peninsulas in the school yard for the pupils after a rain. Such exercises are useful, but only as means of illustrating statements and definitions. They are devices which a skilful teacher employs as occasion demands and circumstances make possible. Observational geography is the direct study of actual geographical facts for the purpose of creating an interest in them, cultivating the power and habit of geographic vision and thinking, and developing basic knowledge of the subject.

It is impossible to map out a definite course of study, because schools differ much in their environment. It is also undesirable to plan a separate course in observational geography for any school, as some of the work is preparatory to book study while some is incidental. It is likewise unpedagogical to teach everything in the neighborhood before anything remote is taught, because some things remote are as easily learned as some things near, and are much more important; nor must only the things mentioned be taught, as others may be equally accessible and equally easy and useful to teach. Whatever, therefore, is presented on the subject is not given as law but by way of suggestion, and the order of the lessons is not fixed.

POSITION AND DIRECTION.—Position and direction may be studied anywhere, and as early as the third grade. The lessons may be introduced by means of a story of a man who wished to travel through a great forest or over a trackless prairie, and by asking the pupils how he could know the way to go. If they cannot suggest a way the teacher may show a pocket compass, or better still, to excite curiosity and interest, make one and exhibit its properties. One can be easily made out of a straightened piece of watch spring. By heating it in the middle a loop may be bent in it, around which thread may be wound, like this  . It may then be magnetized with a magnet and balanced on the point of a needle stuck

through cork, so that it will move sidewise freely. This will help to teach north, south, east, and west, and the points half-way between.

A question as to what he would do without the compass might lead some who happened to know to tell how it could be done by the sun, and thus introduce a complete lesson on telling direction by the sun. This might be made a step to a lesson on the pole star, one that is always interesting.

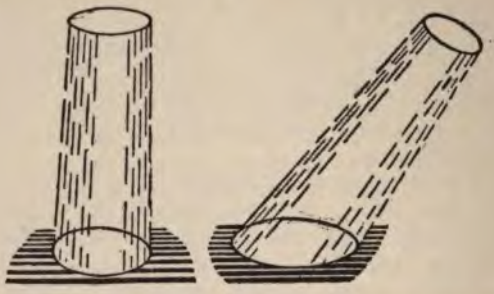
These lessons would properly be followed up with exercises like telling the direction of the extensions of the well-known roads and streets near the schoolhouse, the direction from the school of well-known houses or other buildings, farms, groves, and other physical features in the country; and of public buildings, factories, and parks in the city.

Exercises on distance naturally connect themselves with those on direction, and together they become related to the study of topographical, industrial, and commercial features within the reach of the pupils, and finally also to map-making and map-presentation

Daily Changes of Temperature.—Another thing that may be studied anywhere is the changes of temperature from morning to noon and from noon to evening. This involves the use of another useful and interesting instrument, the thermometer. Have the pupils read the thermometer on several successive days, in the morning before school opens, in the morning recess, at noon, in the afternoon recess, if there is one, and again at the close of school, helping them, of course, to know the meaning of the figures. Pupils naturally know that the temperature varies through the day, but now they know more definitely and observe it with special interest. This prepares them to know something of the reason.

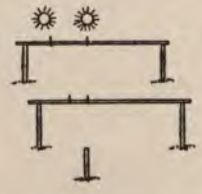
They may by questioning be led to notice the relation of the greater warmth of noon to the greater directness of the sun's rays, and the greater coolness or cold of the morning and evening to the greater slant, or obliquity, of the rays. It is worth while to attempt an explanation

of the relationship. It may be done with the aid of diagrams like the following:



THE CHANGES OF SEASON.—Another series of observations that can be made anywhere may cover the principal facts connected with the changes of the seasons. Commencing early in the fall at a fixed convenient time in the day, the reading of the thermometer may be taken and recorded, and the records averaged at the end of the week. The record of the weekly averages will definitely indicate the change from the late summer temperature to that of the depth of winter, and from that, to the warmth of spring or the beginning of summer.

The corresponding changes in the sun's position in the sky may also be noted and recorded. It may be done by supporting two light sticks of wood on posts so that they will be parallel, extending north and south, and about six feet apart. A stake set in the ground about six feet



west to mark the point of observation, as indicated in the diagram, will make it possible to note the southward progress of the sun in the fall and early winter, and its north-

ward progress in the late winter and spring. Notches on the bars may be used to measure and record it. Observations every second Friday morning just before school would do well.

The changes of position will harmonize in a general way with the changes of temperature to be learned from the recorded averages. This the pupils must learn to see. So they should learn to note that the temperature change from fall to mid-winter and from mid-winter to spring varies, as it does from morning to noon and from noon to evening, with the less or greater obliquity of the sun's rays.

With these changes occur others interesting to children, beyond measure. There comes a time when the swallows and the blackbirds and, afterwards, the robins and the bluebirds assemble for departure and then wing their way to the sunnier clime of the South; when the poplars and hickories turn yellow, and the dogwood and maple are clad in scarlet and purple and gold; when by and by most of the trees are bare and the ponds are frozen over. These things may all be noted and reported by the pupils either orally or in writing.

If this work is good in the fall, it becomes better in the spring. Then the processes are reversed, and there is wonderful pleasure to be derived from observing the new making of the poem of the seasons with the magnificence of its panoramic setting.

WIND AND RAIN.—Observations on the relation of wind to rainfall are also everywhere possible. If continued for a considerable length of time, they may become valuable. It is desirable to have pupils form the habit of noticing the direction in which the wind is blowing while the clouds gather, the duration and character of the downpour, and the direction of the wind when the rain ceases. This will help them to know where are the main sources of supply and the laws of distribution.

In connection with these observations they may learn to read and interpret the barometer and make experiments in evaporation under different conditions of temperature. They may likewise produce dew artificially.

SOILS.—Attractive lessons on soils may be developed

even in the city. Different kinds may be kept in boxes, and in them plants may be raised under different conditions of heat, light, and moisture.

SPECIAL LOCAL GEOGRAPHY.—In selecting the lessons peculiar to his own neighborhood, the teacher must exercise his own good judgment. Everywhere he may find abundant material even in a district apparently little favored. The region in which this is written is considered rich from the standpoint of health and scenery, but otherwise poor; and yet the geographic material to be gathered here would fill a large book if described but simply.

SOME LOCAL TOPOGRAPHICAL FEATURES.—The writer's home is on the edge of a town having about ten thousand inhabitants. Less than three miles away is a mountain about fifteen hundred feet high. It is covered with timber. Through a narrow gap in this mountain flows a large river, leaving room for a railroad and a narrow driveway on each side. Fifteen miles away in another direction is an extensive plateau two thousand feet high and over. On its top are towns, villages, and farming districts, as well as large timbered areas. Between the mountain and the plateau are many hills and, therefore, also many valleys. At several places near by the valleys spread wide. There they are small plains covered with pleasant farms.

These valleys have streams flowing through them. One large stream flows through the town. Within the town limits it receives the tributary waters of two other considerable streams, and of another just below. The main stream, the master stream of the tributaries mentioned, is itself a tributary. It flows into the great river at a beautiful spot near the gap through which it finds its gateway to the more open country beyond and finally to the distant ocean.

A large spring in the town sends its cool waters into the local master stream, and by the side of a street these again accept tribute from another spring where the public may stop to drink.

The main stream comes down from the hills with a rapid, dashing flow, and so do most of its tributaries. In two of them are beautiful waterfalls. Two meander

through lowlands some distance before entering the main stream, and it has built up a considerable flood plain in the lower part of its course, and it has formed a delta where it meets the river.

Beyond the nearest ridge, which parallels the mountain, a creek winds in and out through a rich valley. In it are oxbows fully developed and cut-offs plain to the eye.

Surely there is abundant material here for direct study, and allurement to enjoyable excursions. Cannot these be made more interesting and profitable than committing to memory definitions almost barren of meaning, and the names of towns and capes fully as meaningless as they?

Some Things the Streams are Doing.—The study need not and should not stop with topography. Topography is the background or basis for many things. All the time something is being done. Among other things, the streams are busy. In spring and summer they make and keep the meadows green and other bordering lands richer in vegetation. When they are in flood they may sometimes be seen cutting new channels for themselves, and always modifying their old ones at one place or another. They are then also yellow with sand and mud, which they are carrying along to contribute to the burden of another stream or to deposit where their waters are checked in their flow. These deposits may be found when the floods subside. One result of this activity is to be seen in the mill ponds. A number of them are plainly filling up, just as lakes fill up and die.

The sources of the material they carry may easily be learned in the neighborhood. At the Gap the mantle rock is breaking up and slipping down, piling up huge heaps of talus. Similar phenomena are to be seen at a number of points. At a number of places there are outcroppings of black shale that plainly show the effects of weathering. At all these places the rains find materials to wash away.

Besides being able to see how the waters swallow ground from the banks when they are swollen and fierce from the rains, the rocks at the waterfalls show how they are slowly being worn away.

The exposed hillsides, especially the newly-ploughed

cornfields on them, with their furrows and gullies after a heavy rain, show how they are robbed of their fertile soils.

So right here young people may learn how, the world over, the highlands are being worn away and the lowlands enriched and extended.

GLACIATION.—Everywhere throughout the neighorhood may be seen the results of glaciation, as this is part of the region that was covered by the continental ice sheet. There are many moraine ridges and kames, great hills of sand and pebbles, to be visited and studied. In many localities are striated rocks, and the foundation soil of many fields is glacial drift. There is a number of small lakes and the drained beds of a number more, which plainly reveal the secret of their construction. There are also well-defined post-glacial terraces.

THE HILLS AND THE FARMS.—The hills lessen the area of farming lands and vary it. Some of the hill farms with their abundant stones and meagre soil grow grass better than anything else, and are dairy farms. These led to the location of a creamery in the town. So the milk can be traced from its source on the farm to its manufacture into dairy products and to its distribution in the latter form.

One of these farms has been converted from a dairy to a poultry farm. This is made profitable by the city boarders who seek rest among the hills in summer, and by the convenient railroad transportation to New York City, which is not far away.

This latter condition has led a man to establish a large duck farm on one of the streams near town. This presents another subject for study.

The valley farms produce more grain than do the hill farms with their lighter and thinner soil. The pupils can thus study the soils on widely different farms, observe their differences in character and depth, and learn the relation of these things to production and business.

ELEVATION AND CLIMATE.—Here it is easy to study the effect of altitude upon climate. Often when it rains with us it snows on the near-by plateau. Frequently there is good sleighing there when the ground with us is bare.

On our lowest ground the forest trees are green a long time before those on the plateau lose the dreary nakedness of winter, and the cherry trees are in full bloom all of two weeks earlier than nature permits them to be up there.

Because of the more assured duration of low temperature, ice companies have made artificial ponds all over the plateau for the harvesting of ice, and it is a common thing to see train loads of ice pass over the trunk railroad through our town on the way to large cities.

THE MOUNTAINS AND THE WINDS.—In the summer time the effect of mountains on the direction of winds may sometimes be plainly seen. When showers gather, the clouds may be seen to move along majestically in a fixed direction until they reach a mountain or range of hills, when they file off to the right or left up or down some valley and give it the benefit of a rain that seemed intended for another section of country.

THE MOUNTAINS AND INDUSTRY.—The hills and mountains are well wooded, though most of the stately trees of a generation ago have been cut away. The timber now standing, while not so large, is valuable, and presents a number of geographical facts for study.

Just above town is a saw mill in which larger timber is sawed into lumber. In the towns are several large lumber yards and planing mills. These give employment to a number of people. Once they handled only native lumber, but that is no longer sufficient, so they procure supplies from the South and the Far West.

The smaller timber is cut into railroad ties and mine props, for which the town furnishes the shipping point. Recently a short railroad was built to the edge of a large timber area. This gives the people in that section access to the markets for mine timber and a new source of revenue. When the pupils in the schools study these things, they get a new interest in the anthracite coal region, not far away, where the timber is used. They may also acquire new appreciation of the importance of transportation.

Just below the town is a wood-pulp paper mill. It was located there because of the excellence of the water-power, the abundance of available timber, and the railroad.

Though the local timber supply has decreased and is now insufficient, a new railroad that passes the mill cheaply makes good the deficiency. Quite a village has grown up near the mill. This furnishes a lesson on the relation of industry to population.

In the town is a large tannery which still gets much of its bark from the neighborhood, but all its hides from Chicago and Kansas City. This latter fact again directs attention to the value of railroads, and is an index to the resources of the great central plain.

OTHER SUBJECTS FOR STUDY.—The abundant water-power, cheap coal because of the nearness of the anthracite region, and the trunk line railroad have brought here other industries that contribute to the number and wealth of the population. There is a large silk mill which imports its raw materials from Japan and Italy. There are two boiler works, also a woollen mill, an engine works, a glass factory, and car shops. So there is necessarily considerable incidental industrial and commercial activity. All this is interesting to study, and it helps pupils to understand the activities and conditions of life the world over. This is, indeed, a miniature world, beautiful and busy.

OUTLINE FOR LOCAL GEOGRAPHY.—For suggestion and guidance there is here given an outline for the study of local geography.

For country geography:

A. Land forms.
1. Hills and mountains.
2. Valleys.
3. Plains.

B. Water forms.
1. Springs.
2. Creeks.
3. Rivers.
4. Ponds and lakes.

} In relation to one another, to land forms, and to vegetation.

C. Relation of temperature to direction of sun's rays.
1. Daily.
2. Yearly (seasons).

D. Water.
  1. Evaporation (by experiment).
  2. Condensation (by experiment).
  3. Rain.
  4. Snow, hail, and sleet.

E. Soils and rocks.

F. Forests, meadows, orchards, grain fields.

G. Variations of plant life dependent on
  1. Temperature.
  2. Soils.
  3. Moisture.

H. Changes of plant and animal life dependent on seasons.

I. Human life.
  1. Occupations.
  2. Institutions.

For town or city geography:

A. As much of above as may be.

B. Elevation, slope, and drainage.

C. Streets (length, drection, and slope).

D. Inhabitants.
  1. Number.
  2. Origin (racial and local).
  3. Characteristics.

E. Institutions.
  1. Government.
  2. Schools.
  3. Churches.
  4. Business.

F. Factories.
  1. Sources of raw material.
  2. Market for products.
  3. Number of employees.

G. Means of communication and transportation.
  1. Public roads.
  2. Railroads.
  3. Canals.
  4. Natural waterways.
  5. Telegraph and postal conveniences.

GEOGRAPHIC REPRESENTATION IN LANGUAGE.—No other study gives better opportunity for language training than does local geography. The little excursions necessary to observe the features of the neighborhood and the interesting knowledge gained do not only furnish the best of materials for expression in language, but also arouse the enthusiasm which gives eloquence to the tongue and facility to the pen.

PICTORIAL EXPRESSION.—What is true of the value of this study for language training applies equally well to drawing and coloring. The coming of bird and butterfly and flower that marks the advent of warmer weather, gives numerous subjects for beautiful and useful picture work, and the supply continues as the seasons come and go. Always there is something to draw.

An interesting record may be made with pencil and brush of the change from winter to spring and from spring to summer, by selecting a certain fruit tree and making colored drawings of the changes that take place in one of its branches as the season advances. These drawings should be made at regular intervals, say once a week.

First there will be the twigs with only the buds. These may be dissected. As the warmth increases the buds swell. After a time they burst into leaf and flower. A little later will come the fruit, small and green at first, but after a while ripe and luscious and beautiful of form and color. Cherries, apples, pears, and peaches do nicely for this work.

MAP REPRESENTATION.—The distinctive representation of geographic fact is the map. Pupils should be early taught to make both plane and relief maps. It is through the maps they themselves make that they learn to interpret the maps of others and of regions they themselves cannot at the time visit.

When they study the relief forms of the neighborhood, they may model them in the sand of the moulding table. These relief maps need not be made to a definite scale. There are many reasons, in fact, why they should not be so made.

Plane maps should be drawn to a scale from the beginning. Much training is necessary to enable a pupil either

to make or to read one. The simplest first one is a map of the schoolroom.

Before attempting to draw a map of the room, the pupils should locate its parts and the objects in it geographically. After the sides of the room are clearly fixed as the north, east, south, and west sides, and the doors and windows definitely located as well as the furniture in the room, measurements of the distances should be made, a scale determined on, and the relative lengths of the objects and their relative distances from one to another calculated. The map should then be made on a horizontal surface with the parts corresponding to the represented parts of the room in real position.

After the map is finished it should be fastened to a wall vertically with the north side at the top. Now the marks on the map with their relative positions, directions, and distances should be translated into the parts and objects of the room and their real positions, directions, and distances. Much drill of this sort is necessary to give pupils the ability to assign real and proper meaning to the relative distances and locations of maps.

What is done with the schoolroom should next be done with the school ground, and afterwards with different sections of the neighborhood.

First Interpreted Maps.—It would be well to select the county map as the first map to be studied that takes the pupils beyond the range of immediate observation. This is so because of their special interest in the county and because they are in position to verify or correct most of the ideas thus acquired. The study of the state map might follow.

An Elementary Course in Geography

We are now in position to know how to teach geography in a locality like that described.

In the Fourth Grade.—In the fourth grade, the first in which it seems desirable to begin something like systematic geographical study, we may teach the shape of the earth, its rotation, day and night, the related changes in temperature, and the principal topographical features of

the neighborhood. This involves the teaching of direction, distance, and size, and of maps and map-making.

The relation of the rotation of the earth to day and night should be taught in a darkened room with a lamp and a globe or a baseball.

The pupils may study the topographical features as a class under the guidance of the teacher after school in the afternoon or on Saturdays, or they may be directed to go to the proper places as opportunity offers. In such case they should be told what to look for. Always they should be required to make either oral or written reports of what they have learned.

There belongs to this grade also the reading of books like "The Seven Little Sisters," "Each and All," "Aunt Martha's Corner Cupboard," "Little People of Asia," and simple stories of travel by land and sea.

IN THE FIFTH GRADE.—In the fifth grade the pupils should study a simple description of the world as a whole, including in the study the principal political divisions and the location and population of the chief manufacturing and commercial cities and of the leading capitals. This general description necessitates the review of the earth's shape and rotation, and the teaching of its revolution and of the terms axis and pole.

The location of the poles as the ends of the line on which the earth rotates is easily illustrated by temporarily pasting small disks of paper in a line on the surface of a large ball or globe so that the end disks will be exactly opposite each other and may be used to mark the ends of the axis when the ball is rotated. The intermediate disks will describe circles, the end ones will not. They locate the poles.

To teach the revolution of the earth and the results it effects because of the inclination of the axis, it is advisable to use a globe that is easily handled and a lamp. They will enable pupils to understand what is meant by the polar and tropical circles and the equator, and by the climatic zones.

It is desirable to teach now the equator, the tropical and polar circles. The poles are already located. So it is easy to dispose of the equator as a line around the earth

half way between the poles. As it serves for convenience in locating, pupils may be given the opportunity to discover it. If they are successful, their knowledge will be more pleasurable and valuable. For the purpose a ball will serve, with chalk dots for the poles. They should be marked north and south and the pupils asked to suggest plans for the easy location of lines and spots between. With little help they may be led to understand the scheme of locating by means of degrees north or south of the equator or north or south from the poles.

Next to teach in the order of ease are the polar circles. To teach these, light a lamp and darken the room. Holding the globe so that the north pole points continually towards the north point in the heavens, carry it around the lamp. When the light begins to fall short of the pole, have the pupils observe carefully how the light hemisphere recedes from and again approaches the pole. Continue this until they have fixed upon the point of greatest recession from the pole. Direct attention to the facts with questions such as these: "Does the light reach the pole now?" "Is it still receding from the pole?"

After the point of greatest recession has been fixed, ask the pupils what the earth does every day as it journeys around the sun. It rotates. Have a pupil hold a pencil at the point of greatest recession, and rotate the globe. The result will be a circle.

Repeat the process for the light when it shines beyond the pole. When the farthest point reached has been determined, again describe a circle with a pencil held there while the globe is rotated. The circles will coincide, and the uses of the arctic circle will be made plain with its location.

The antarctic circle should be located in the same way.

The tropical circles are not so easily located. Their location should be preceded by observation of the relation of the changing position of the sun north and south to the change of the seasons. The apparent northward and southward journey of the sun can be well illustrated by means of the globe and the lamp. To indicate, however, the exact location of the circles, it is necessary to use a lamp fixed to a stand that holds opposite to it a section

of a metal disk to represent a part of the sun's surface. A rod may be fixed to this to represent a line from the centre of the sun to the centre of the earth, the line of direct ray. When this has reached its most northerly point as the globe is moved, a rotation of the globe causes a circle to be described on its surface. This indicates the tropic of cancer. When the rod has reached its most southerly point, it describes the location of the tropic of capricorn on the rotated globe. Theoretically these circles bound the light zones. With these the temperate zones approximately correspond.

Special lessons should be given on the temperate zones. They are easy. Move a globe around the lamp again. Direct attention to the area over which the direct rays move. Have one or more pupils move a hand over the surface of the globe from the equator to the poles. If the globe is near enough to the lamp the decrease in temperature will be plainly sensible. Thus the tropics may be taught as the approximate boundaries of the torrid zone.

By fixing attention in a similar way on the polar regions, the arctic circles may be taught as the boundaries of the frigid zones, and the temperate zones may then easily be located.

The lessons on the changing temperature of the days and the seasons will enable pupils to understand this.

Related to these lessons are those on the varying length of day and night. The six months of day at the poles and the alternate six months night are easily illustrated with the globe and the light. It is nearly as easy to teach the relatively fixed twelve-hour day at the equator.

To teach the varying days and nights between, the globe and lamp will serve well. A little piece of white paper stuck to the globe may represent a boy passing days and nights as the globe rotates through light and shade. The exact length of his days and nights in different latitudes may be calculated by measuring the width of the light area with a metal measuring arc, finding its fractional part of a whole circle, and taking this fraction of the twenty-four hours needed for the complete rotation, as his day. The rest of the hours will be his night.

It is plain that for these last lessons there must be some preparation. A few questions and a little use of the globe and the lamp will furnish this. Do we now have day or night? Why do we sometimes have day and at another time night? If the lamplight represents the sunlight, the globe the earth, and the paper disk a boy, what is it now for him, day or night? What now? What change is taking place now? Why?

The teaching of location, with reference to the equator and the poles, involves the teaching of the measurement of circles and quarter circles by degrees, and should be followed by instruction in location with reference to both the equator and accepted meridian, the definite location by degrees in terms of latitude and longitude. The boundaries of continents should be so fixed, and the pupils should be diligently drilled in so locating important cities, islands, and countries. One form of this drill is to state the latitude and longitude of one city after another and have individual pupils find it on the globe or a map. Exercises like these will prevent the misconceptions of location that without them persist for years, even with intelligent people. Not every well-read man can tell when unexpectedly called upon to do so whether Paris is most nearly in the latitude of Boston, New York, Philadelphia, Richmond, or Savannah.

Fifth Grade Supplementary Reading.—A simple study of the world as a whole is necessarily meagre of details. Much supplementary reading is needed to give life and interest to the work. The reading material should satisfy the likes of children. It should describe plants and animals in different parts of the world, the homes and towns of people, and their customs and costumes.

Maps to Make Knowledge Definite.—The drawing of maps should be considered an essential part of this and later world study. Nothing helps to fix the outline and relative size of a country upon the mind so well as drawing a map of it, and so nothing else helps to impress the relief so well as modelling a map of it.

The only guide to be used in the drawing of outlines should be the lines used to indicate latitude and longitude. As soon as pupils are old enough to work out a scale, they

should be required to draw their maps on assigned scales different from those used in the books from which they study, and often on scales different from those assigned to other pupils.

Outdoor Work.—The outdoor work of this grade is abundant. It is now that the pupils should be led to observe the changing position of the sun and the features that mark the changes of season. Now they should also begin to study the industrial and commercial activity of the neighborhood. The products of the farms may be studied as to kind and quantity, and may be followed in their distribution through the local and distant markets. The pupils may learn what people are employed in the factories, where the raw materials come from, where the manufactured products go, and how these things are transported.

The observation of the forming of systems of streams also belongs to this grade.

IN THE SIXTH GRADE.—In the sixth grade the work of the fifth should be reviewed and continued, and the systematic study of the continents begun. This study should be still mainly descriptive. One of the best series of books for it is Carpenter's "Geographical Readers." If more meagre outlines are used, much reading of books of travel, like Knox's "Boy Travellers," is valuable.

The Use of Devices.—In descriptive work in geography many devices must be employed by the teacher. The more realistic these are, the better. A little patch of ground in the school yard around which waters flow after a rain illustrates an island better than a drawing on a blackboard.

The picture is one of the best aids to description of things foreign. Teacher and pupils may cut many of these out of illustrated papers and magazines, out of railway guides, and out of books of travel, and advertisements of resort regions. Since firms have begun to make sets of pictures especially adapted to geographic illustration, the stereoscope has become a valuable addition to class apparatus. Whenever it can be afforded, a stereopticon and a large collection of slides should be added to the equipment of the school. This furnishes the best pictorial illustrations of all.

IN THE SEVENTH GRADE.—In the seventh grade the work on the continents should be continued, and the observation work made to assume a somewhat different character. The pupils are now ready to study things more in their relations. What they have learned in previous grades may now be reviewed in such way as to make plain the relation of the topographical features of the vicinity to its industrial and commercial activity, and of the mountains and hills to the systems of streams, to the depth and character of soil, and to the preservation or destruction of forests.

Now also may be learned by observation the functions of streams, drainage, irrigation, erosion, abrasion, transportation, and deposition, what are termed their physiographic features. In many portions of the northern United States are also manifest to the eye the results of glacial action, making it possible to understand the origin of our northern lakes. This is a good year for the study of the relation of winds to the distribution of moisture, and for learning to interpret the government weather reports.

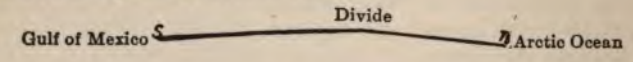
Not by any means the least valuable thing to be studied this year is the history of the growth of the town in which the school is located, if it happens to be in one. This may be made very interesting and may flood with light the whole subject of geography as the study of the earth's surface as the home of man.

IN THE EIGHTH GRADE.—With the eighth grade begins the regular and systematic study of Geography as a science. With minds rich in information, trained both to observe and to reason, the pupils are now prepared to learn the whole catalogue of important geographical facts in their proper relations. The continents must now be studied again, not however as mere aggregations of numberless facts, hard to remember, but as fascinating, complex unities.

In this advanced course the pupils should give considerable attention to the ocean currents because of their influence on climate and navigation.

Special effort should be made in this grade to give to the relief of the continents the prominence it deserves.

The pupils should be made thoroughly familiar with the general plan of relief peculiar to each continent and required to indicate it with proper diagrams. A diagram like the following may be employed to indicate the north and south plan of North America:



The ground plan east and west is like this:

After the relief of a continent is mastered, each member of the class should be required to make a neat relief map of it. The simplest map of this kind is made of paper pulp with which a little flour has been mixed. The pulp can be made of old newspapers by soaking them in warm water and working them with the hands. When the pulp is sufficiently fine and soft, the surplus water may be squeezed out and the flour added. The map may first be made on a board, and, after it is dry, mounted on cardboard with glue.

Outline maps should be carefully drawn with reference to gulfs and bays, important in their relation to commerce and civilization, and to prominent capes as landmarks and as dangerous and troublesome hindrances to the free passage of the seas.

Map Records.—As each series of facts is learned in the study of seas or continents, a drawn record should be made of it on outline maps prepared by the pupils themselves or purchased for the purpose. Such maps can now be bought for almost nothing, and they save precious time.

When the relief of a continent is studied, in addition to modelling maps of it, the pupils should indicate the different contours on a plane map with shades of color whose value should be plainly shown in a key accompanying the map.

The river systems should be drawn on the same map, and the annual rainfall indicated. The areas of same rainfall may be bounded with lines and the quantity ex-

pressed with figures, or they may be colored with shades of color varying with the quantity of precipitation. If colors are used the rainfall map had better be a separate one.

The agricultural, animal, mineral, and manufactured products of countries may also be shown with a color scheme, or by fastening to the map samples or pictures of the products.

The distribution of population may also be indicated with a color scheme, and its density indicated with figures.

The political divisions studied should be treated in the same way. On the maps of them should be marked, in addition to other things, the location of the principal industrial and commercial centres, the capitals, the canals, and the railway and steamboat routes.

This work may profitably be continued through the ninth grade.

ADVANCED GEOGRAPHY.—The work in geography naturally completes itself in three branches: physical geography, physiography, and commercial geography. As special studies they belong to minds of considerable maturity. Commercial geography is serviceable particularly for pupils who intend to enter a business career. It should include the study of the great commercial cities, the goods they handle, both as to kind and to quantity, the sources of supply, the markets through which they are distributed, the modes, routes, and cost of transportation, and the methods of settling accounts.

THE FACTS OF THE SCIENCE.—It must always be borne in mind that the facts of geography are as numerous as the sands of the sea. It is impossible to learn and remember them all, and very undesirable it would be to do so if it were possible. Throughout the course care must be taken to fasten upon the mind the things that are of sufficient importance, with proper drill and device, and not to overburden the pupils with unimportant details.

CONCLUSION.—Appealing, as geography does, to the love of travel, the eager desire to explore new regions, the active imagination and careful thinking, and connecting as it does the natural sciences with history and literature, it should always be an interesting study.

CHAPTER XIX

HISTORY

VALUE.—History is one of the noblest and most fascinating of all the branches of study. No other touches the mind in so many ways or affects it more deeply. The history of the nation and the race presents problems that challenge it to the profoundest thought and inspire it to the highest and broadest flights of imagination. It appeals to national and race pride, and at the same time prompts to self-sacrificing devotion. It enchants with its stories of perilous adventure on land and sea, of marvellous achievements in science and invention, and of mighty conflicts with stubborn wildernesses and powerful foes. It presents pictures of the heroic deeds of patriotic men, of the tearful sacrifices of no less patriotic women, and of the devoted labors of inspired saints. It is a moral teacher of the highest order, because it reveals virtue and vice in action and their results in concrete reality. It increases respect for all institutions that are good by disclosing the long and complex processes of their development and the priceless sacrifices necessary to secure them, and so stimulates to the exercise of those civic virtues that only can maintain them. It broadens the mind by enlarging the sweep of its horizon, and multiplies and intensifies its sympathies by establishing a truer perspective of human hopes and efforts.

SCIENTIFIC CHARACTER.—No branch of learning has been more deeply or beneficially influenced by the modern revival of science and philosophy. The study of history has been radically revolutionized within recent years. It has taken to itself the form and dignity of a science, the science of the progress of civilization among the nations of the earth.

In this statement certain truths are implied. They are that history is both national and general; that it is possible to recognize causal relationship among the facts of his-

tory; that the race is in process of evolution; and that the facts of history vary in value with reference to this process.

NATIONALITY IN HISTORY.—History deals primarily with national life. What is known of life prior to national organization, the historian uses only as he needs it to explain national characteristics and development. The detailed and comprehensive study of this primitive life and the exposition of it he leaves to students of archæology, ethnography, and ethnology.

UNIVERSALITY IN HISTORY.—The history of any one nation is but a chapter or series of chapters in the history of mankind. It is a thing in itself incomplete. It becomes comprehensible only in relation to the history of other nations. No one may claim to know the history of our country who does not know the history of England and much of the whole development of western civilization.

CAUSE IN HISTORY.—The growth of society is not a matter of chance. It is governed by law. The facts of history are not independent occurrences. They are conditioned, and so conditioned that we may properly apply to them the terms cause and effect.

At first sight it seems that these statements cannot be true, because the mind is the supreme factor in history. Back of the deeds of men and the conditions of life are sympathy, hope, conscience, ambition, and will. But while these individual elements do exist and make it impossible to define the exact limitations of the proposition that law governs social development, the proposition is still true. It is true because the mind does not function in the abstract and arbitrarily. It reacts upon its environment, and these reactions conform to law, the law of mental growth and being. So the representative men of a nation at any time, its leaders, are those most keenly alive to the challenge of existing conditions, better able to organize their thoughts with respect to these, and more skilful and efficient in appropriate action.

While, therefore, human affairs are too complex to allow the possibility of predicting with any degree of exactness what will happen next, the accomplished status of a people at any period in its development is an in-

telligible thing. Step by step it may be traced backward through series of events and conditions until at last it is revealed a natural growth rooted deep in the soil of many countries and in the hearts and minds of many generations.

HISTORICAL VALUES.—It follows that the facts of history do not take their value from the number of people involved in creating them nor from the strength of their appeal to the imagination. They are important as they contribute to the progress of civilization and, to the historian also, as they reveal its character. The invention of the printing press gave to civilization a century pace, and the simplest possible teaching of truth by the humble and lowly Nazarene in an obscure part of the Roman empire founded in the lives of men an empire more extensive and lasting than that which the Cæsars conquered with their legions, and infinitely more powerful and beneficent.

THE COURSE OF SOCIAL EVOLUTION.—Society begins in crude and simple forms of organization, the clan and the tribe, and advances towards large, complex, refined, and highly-organized forms of national life and international alliances. In this progress numerous portions of the race have participated little, if at all, other portions have advanced from savagery to barbarism, others through savagery and barbarism to a state of semi-civilization, while still other portions have advanced to relatively high stages of civilization. Some nations progress rapidly, while others have remained almost stationary for long periods of time. A number of nations after long and vigorous growth have decayed and lost their identity, but the general progress of the race has been onward and upward.

FEATURES OF SOCIAL EVOLUTION.—The evolution of the race manifests itself in varying types of national life, in the advancement of the individual in intelligence and character, in the improvement of his relationship to society, and in changes in the social institutions. These institutions are the family, the government, the church, the school, the industries, the professions, and what may be termed the social customs.

At any given stage of social development the world over, these institutions have common fundamental characteristics. In the United States, for instance, a church of any denomination differs in a noticeable way from a church of the same denomination in Russia or Germany, especially so if the denomination has been long established in both countries. Similarly family life in the United States is markedly different from that which prevails in Germany or Russia. Again, in the United States to-day the family life differs materially from that of the colonies out of which the country has grown. The same is true of other institutions. In any country a radical change of government works corresponding changes in the other institutions of society or is coördinate with them.

It is, therefore, possible to find illustrated somewhere on the earth almost every stage in the process of social development and the forces at work that condition its progress.

The Factors of Historical Growth.—The factors whose influences are manifest in the evolution of nations and the race are physical and social. These two kinds of factors coöperate in various ways and with correspondingly different results.

Physical Factors

Relation to Population and Wealth.—To any one who gives the subject but a moment's thought, it must be evident that a large, active, and wealthy nation cannot grow up in a small country, nor even in a large country deficient in natural resources, and that it can grow in a large country whose climate is unfavorable only when its natural resources are very abundant.

It must also be evident that the early multiplication of population must occur in countries where the climate is favorable and the resources easy of access, as was the case in ancient Egypt and Mesopotamia. In countries less favored in these respects, even though they are rich in resources, it must wait for growth in intelligence, ambition, and industrial skill among people, and the crowding of population in other lands.

The large population, wealth, intelligence, activity, and inventive genius of the United States are largely due to its favorable climate, its vast extent, its fertile soil, its wealth of timber, its immense mineral deposits, its large and numerous harbors, its great lakes, the number of its long and navigable rivers, and the overcrowded condition of European countries.

Relation to Intercourse with Other Peoples.—The location and physical features of a country also determine the periods and degree of a people's isolation and the character and periods of its intercourse with other lands, as well as the selection of the people with whom intercourse may be established. They moreover largely determine the periods and character of migrations.

In the case of China, for instance, the Himalaya Mountains on the south, the inhospitable regions on the north, and the Pacific Ocean on the east, isolated the country until it had developed a unique civilization. This maintained itself almost unmodified for many centuries until steam navigation, the railroad, the telegraph, and the telephone subjected it to influence and pressure from without.

Until recently the Pacific Ocean made Asiatic migrations to the American continent next to impossible, and the Atlantic prevented migrations from Europe until many of the great problems of civilization had been well advanced toward solution. It is also true that when European immigration began the Atlantic was broad enough to keep back the wealthy and powerful, who clung most closely to the customs and traditions of the past, as well as the weak, the incompetent, and the unambitious. So nature made for America a selection of the strong, the resolute and energetic, the best of the earth, to build up new nations with a new civilization, nations destined in the providence of God to be powerful enough in influence to modify the whole world's life for the uplift of humanity.

Relation to Phases of National Development.—These physical influences are also powerful in determining the details of national development.

The harsh climate and sterile soil of New England,

for instance, are unfavorable to agriculture. Naturally the energetic and ambitious people of that section of our country turned their attention to the fish abounding in the neighboring waters of the ocean, to the extensive forests of the North, and to the swift-flowing streams. So the New Englanders became fishermen, lumbermen, ship-builders, seafarers, manufacturers, and merchants. They built up flourishing cities, accumulated wealth, established colleges and public schools, early in our history became tariff protectionists, and gave to the country great statesmen and its first series of distinguished writers.

Different physical conditions in the South produced widely different results. The rich coastal plain of that region, expanding upward as the lower Mississippi valley, and its warm climate, made the cultivation of cotton, tobacco, and rice profitable, put a premium upon slave labor, bound the population closely to one form of industry, agriculture, and gave a distinctively mediæval character to its civilization until the Civil War wrought a painful but beneficial revolution.

Relation to Internal Movements of Population. —Population tends to move along the parallels of the home latitude. Ease of migration increases the tendency, if it coincides. Only greater ease of travel or superior advantages otherwise turns it northward or southward.

The Mohawk valley and the chain of the Great Lakes, coupled with the agricultural conditions of New England, directed the first great tide of American emigrants into the Northwest Territory from the New England States and New York. At a later time Scandinavians, Hollanders, and Germans from approximately the same latitudes followed the same route.

For a long time the Alleghany plateau hindered or prevented migrations into this region from the states south of New York. So for a considerable time the Pennsylvanian was secondary in influence in Ohio, Indiana, Illinois, and Michigan, and the Southerners made themselves felt only through the overflow population of Kentucky. The results of this are still evident in the social institutions of these states.

Social Factors

Possibly more interesting to the student, and certainly no less potent, are the social factors of a nation's destiny.

RACIAL TEMPERAMENT.—There are marked differences in the virility and energy of peoples in different parts of the world, easily traceable to conditions of food and climate. What is not always recognized and so easily explained is that races often differ radically in temperament. These differences are fundamental in influence and need careful consideration. They manifest themselves in all the institutions of society, in the sports and pastimes of a people, upon the fields of its warfare, on the platforms of its orators, in the studios of its artists, and in the songs of its poets.

There is no doubt that in the religious upheavals that took place in Europe in the 16th century, it was largely due to temperamental difference that the Celtic and Latin peoples retained their loyalty to the old religion, while the Teutonic peoples so generally adopted new forms.

The poetry of Goethe, for another illustration, is decidedly Teutonic in spirit, while that of Moore and Burns is just as plainly Celtic.

So the German temper reveals itself in the number and character of the German universities, in their achievements in science and philosophy, and in the systematic and thorough industrial and commercial training which gives the Germans such a strong hold upon the markets of the world.

CONQUESTS.—Conquests not only extend territorial control. They modify the character of both the conquered and the conquering peoples. It is a very easy matter, because of a growing abhorrence of war, to underestimate the advancements in civilization due to conquests. These are most evident in the overmastering of relatively primitive peoples. They are usually organized into small units. They are separated from their neighbors by differences of language and customs and by prejudiced and hostile feelings inherited from the past. Their activities are simple and limited in number, and their attainments in the arts, science, and literature are elementary

and crude. In all these matters they cling stubbornly to the traditions of the past. Moved from within they change but slowly, if at all.

It has frequently happened that such smaller and backward nations have been by force subjected to the domination of some great power, and have been transformed in a few years as they otherwise could not have been in many centuries. There have been forced upon them or they have peacefully assimilated a new language and literature, better forms of government, higher forms of religion, broader and more varied industrial and commercial activities, and new arts and sciences.

With the conquests of Alexander the Great went the noble language and literature of Greece and Greek philosophy. Centuries after his death Greek universities marked the tracks of his army.

In the case of old Rome, extensive provinces occupied by scattered tribes or loose confederacies were hammered into such compacted unity and so advanced in different phases of civilization that they became the bases of modern nations, in whose laws and languages are still monuments of the greatness of Rome.

Evil Results of Conquest.—The results of conquest cannot all be good. In addition to absorbing the vices of the conquered, the conquerors are very apt to be demoralized by the increase of wealth and power. For them there is likely to follow luxury, exhaustion, debasement of government, and decay.

No less unfortunate are the social effects of successive waves of conquest. They stratify society. In nearly every European country this has resulted in comparatively fixed classes with varying degrees of power, influence, and privileges, and a heritage of corresponding prejudices, hatreds, and struggles.

Slavery.—Slavery tends to produce results similar to these and others equally unfortunate.

In our own country it made one class rich and powerful, the large land-owners who employed slave labor, and kept a much larger part of the white population hopelessly poor. Between the two it maintained a fairly substantial and comfortable class of merchants and skilled mechanics.

Within the slave territory society became distinctly mediæval, the free public school impossible, agriculture the dominant industry, the mine and factory impracticable, the protective tariff an abomination, separation from the rest of the country a thing to be prayed for and fought for, the Civil War a natural result, and there was finally left to the nation a race problem too great for anything but the most Christian spirit, the noblest patriotism, and the wisest statesmanship.

HOSTILE FOREIGN RELATIONS.—Because of their relations to others, nations may be in constant fear of invasion of rights and territory or may be frequently called upon to struggle for their existence. This may lead to the maintenance of means of defence, the forming of alliances, and to still other very important results.

The hostile, or at least suspicious, attitude of the European nations towards one another compels them to withdraw large portions of the population from the productive arts and industries and to expend vast sums of money for military purposes.

Such a peculiar relation to others may cultivate intense national spirit and devotion, and maintain the virility of the people.

In America the proximity of the French colonies to the English led to wars that united the English colonists and trained them to fight the battles of the Revolution.

FRIENDLY FOREIGN RELATIONS.—Under certain conditions nations at peace may exchange commodities and ideas, as has already been noted.

Agriculture, manufactures, and commerce are thus promoted, and wealth is increased. There result also marked modifications of population. This is very apparent in Great Britain and the United States.

The histories of the nations show plainly how the intellectual and moral life of a people may be modified by intercourse with others.

Greece, because of its colonies and seaports, was in active contact with all the enlightened nations of its time and was by them inspired and directed in its best efforts in architecture, sculpture, mathematics, and philosophy.

In America, we read the books of learned and pro-

gressive Europeans, we buy their paintings and sculptures, we admire their palaces and cathedrals, we study in their universities, we benefit by their inventions, and in every way grow richer because of their influence.

IMMIGRATION.—Immigration of people in large numbers from lands differing widely in language, customs, laws, and religion, is one of the distinctive features of social life in the United States. It radically modifies the whole character of our population and deeply affects all our institutions. This form of race mixture differs from all others in that it is voluntary on both sides and mutually advantageous. As soon as it ceases to be so, the foreigner will cease to come or the inhabitant will refuse to admit him. In consequence the tendency in our country is strong towards complete amalgamation and the production of a national and individual type composite, strong, efficient, and broad in sympathy.

The Teaching of History

History lessons like others can be made effective only through the personal resources of the pupils, through their experiences, their capacities, and their interests. These resources may possibly not be as abundant as for most other branches nor so simply developed, and yet they are richer than we sometimes imagine.

KNOWLEDGE OF PRESENT EVENTS.—Because history deals so largely with the past, we often overlook the value of the present. History is now in the making. Pupils in grammar and secondary schools should be kept in intelligent contact with this making through the newspapers and magazines. This demands of the teacher the exercise of excellent judgment. To deluge the pupils with the exaggerated and sensational reports of all sorts of events so common in the newspapers and with the equally sensational and injudicious criticism so often found in both newspapers and magazines, would be iniquitous; but there is every week something occurring somewhere in the world that vitally affects the status of the nations. If plain and truthful statements of these events are published, they should be read and discussed under the guidance and

supervision of the teacher. Training in the ability to give historical interpretation to the events of to-day is the best preparation for the cognizance and interpretation of the events of yesterday.

Social Institutions.—It has already been noted that social institutions vary in number and character with the advancement of civilization. Now all the pupils in our schools are in more or less intimate contact with the family, the school, the church, industry, business, and the professions; and with the state in its administration of law, and possibly also with its military establishment. All know something definite about all these things and have some interest in them. Judicious teaching may increase both the knowledge and the interest.

In favorable localities, pupils may even become well acquainted with primitive forms of society, illustrated by some Indian tribe or by roving bands of Gypsies.

Pupils in the seventh and eighth grades should study the fundamental facts and principles of our civil government, beginning always with the features of it that may be directly observed.

Race Instincts.—However helpful the experiences of the pupils may be, their racial instincts are a still more valuable asset in the history class. The experiences of the race, especially of the race in its earlier stages of development, are deeply registered in our nervous systems. They form the powerful substratum of our conscious lives. How enthusiastically boys fish and hunt, and how eagerly they strive in their play to reproduce phases of savage life! Martial music still quickens the pulse beat of all of us, even if we be advocates of peace; and old and young read or listen to the recital of heroic deeds and adventures with flashing eyes and rapt attention. We are true to the hunting, fighting, and conquering stock of migrators from whom we have sprung.

The First Lessons.—The first result to be sought in history teaching is not so much to fix in the minds of the pupils definite statements of specific events and dates as it is to cultivate a strong human interest, to build in the imagination of the pupils vivid pictures of personages, and social conditions that will furnish the raw materials

for future mature study and create a hunger and thirst for historic knowledge. There is a wealth of material now at command to enable the teacher to achieve this. Much of it is adapted to the fifth and sixth, and even the fourth, grades of our schools.

HOME LIFE.—It is easy now for the teacher to find or work up descriptions of the peculiar family life among the American Indians and other primitive peoples, among the Greeks and Romans, the Chinese and Japanese, and among the people in the northern and southern colonies of our own country. These descriptions may be made very interesting to young pupils. They will so make lasting impressions on their minds and, in the course of time, become the best of historical material.

Each family group is distinctive of the phase of civilization to which it belongs, and thus reveals its basic elements.

In the American colonies the family of the North is sharply contrasted with the family of the South. In the former the father, mother, and children formed a coöperative society. They shared the labors and sacrifices required to earn a homestead and a livelihood. The Thanksgiving and Christmas feasts were occasions for family reunions that not only kept alive a deep religious and family spirit, but fostered an ennobling sense of personal worth as well. It was one of the best schools of democracy that has ever existed. In the latter, the stately plantation mansion surrounded with negro cabins, the negro attendants, the Christmas cheer, the dignified and free-hearted hospitality, and the wealth heaped up by the "bondman's unrequited toil," developed an American aristocracy, chivalrous and attractive, but still an aristocracy. In these things are to be found the keys to great and stirring chapters in the history of our country.

COMMUNITY LIFE.—Equally interesting and valuable material may be found in the community life of the old Spartans, of the old Teutonic tribes with their peculiar religious beliefs and their war expeditions, of the Norsemen, of the Celtic tribes in Scotland and Ireland, of the New England colonies with their union of civil and religious government, and of the pioneer communities of

the West, so frequently huddled together in stockades for defence against Indian attacks.

HERO TALES.—To the period of the community stories belong also the hero tales of old. They are always interesting. They lay fast hold of feeling and imagination. They appeal to deep sources of power within the lives of the children. They may be made stimulants to moral and patriotic enthusiasms. In after years these unforgotten and unforgettable tales will reveal to thoughtful students the genius of the peoples who produced them and enjoyed them; Siegfried is thoroughly Teuton, and Abraham as thoroughly Hebrew.

PIONEER ADVENTURE AND BIOGRAPHY.—Nearer to us and more closely related to the facts that form our present day life are the stories of the pioneers of our own country. They appeal to the heroic elements latent in all children, to the spirit of romance and adventure alive in all of us. Equally interesting are the stories of the leaders in our great national crises. Material of this sort is inexhaustible. How fascinating may be made the stories of Columbus, Cortez, De Soto, Hendrik Hudson, La Salle, Pere Marquette, William Penn, Daniel Boone, George Rogers Clark, Fremont, Washington, Andrew Jackson, Zachary Taylor, William Henry Harrison, Tecumseh, Ulysses Grant, Abraham Lincoln, and a host of others! What a wealth of historic knowledge may be imparted by means of them! What an appetite for more may be created! What incentives to heroic deeds and civic virtues they may become!

THE MIDDLE AGES AND THE BEGINNING OF MODERN HISTORY.—But little behind in interest and value for citizenship, and equally valuable as beginnings of historical scholarship, are the stories of the men and events that made and marked the progress of European life in the Middle Ages and at the beginning of our own time. Here again there is no dearth of material easily accessible and as easy to use. Especially interesting are the stories of the Teutonic conquests of Gaul and Britain, France and England, of Charlemagne and Alfred the Great. Side by side with these belong the stories of the missionaries like Paul, St. Patrick, and Aidan, the teaching monasteries,

and the monastic scholars and teachers, like Bede and Alcuin. Then follow the Norman conquest of England, the Crusades, the wars led by Wallace, Bruce, and Douglas in Scotland, the English wars in France with the stories of Joan of Arc and Edward, the Black Prince, the wars of Ferdinand and Isabella in Spain, the Swiss struggle for freedom, the similar struggle in Holland, and the English Commonwealth with Oliver Cromwell as its central figure. It may be possible, too, to make interesting stories of the invention of printing and the growth of the early universities. All these lessons may afterwards become crystallizing centres for a vast amount of useful knowledge, the means of preparing children for a high type of scholarship.

THE METHOD.—These descriptions and stories may be told by the teacher, and sometimes they should be. Frequently they should be read by the pupils in class and supplemented with outside reading. Whatever is presented to the class should be illustrated with pictures as well and freely as possible, and be localized with the aid of maps. Waste and dissipation should be prevented by requiring the pupils to give oral and written reproductions of what they have learned.

Systematic Study

As early, at least, as the seventh grade, the systematic study of United States history should be begun. This elementary history should still be mainly narrative and largely biographical. In fact, the time never comes when biography is not an important feature in historical study. The events of history crystallize, become concrete, in the great leaders of historical movements. Men and women appeal to our sympathies and admiration, they concentrate our interest, they explain and make real and definite what occurs.

SUPPLEMENTARY READING.—Elementary text-books in history are necessarily brief. They frequently present mere hints of what was, skeletons, as it were, of events and conditions. It is often possible to cover the skeleton with flesh by resort to supplementary narrative and description. This may be done by word of mouth by

requiring pupils to read matter to which they have access. When much additional material is thus introduced, it is well to require pupils to write comprehensive accounts of the periods studied. These compositions may be preserved by the pupils in books kept for the purpose, and illustrated with pictures and maps either drawn by the pupils themselves or secured from other sources and pasted in the books. These books, if carefully revised and corrected, become very interesting and valuable.

TOPICAL OUTLINES.—In addition to composition reviews pupils should be required to make and commit to memory topical outlines of the most important events in chronological order, grouping those that were contemporaneous. Only the most important dates should be committed to memory, but this should be thoroughly done, as the dates help to fix clearly in mind the course of events.

CIVIL GOVERNMENT.—Incidentally many facts of government must be learned by pupils in connection with their history lessons, but besides this a systematic study of civil government should begin no later than the eighth grade. It seems proper to begin with those elements of government with which the pupils are most closely connected, the government of the schools, of the township, borough, or city, for instance. After the local government has been studied, that of the nation should be learned before that of the state, as the nation is the comprehensive unit and appeals most strongly to the imagination. After that, the study of the state government is easy because of its resemblances.

The first lessons should be oral. Many of the different forms of government may be successfully and profitably organized in the school and the civil functions of official and private citizens performed, either as actual parts of the school management and discipline or by way of illustration.

GENERAL HISTORY.—After the elementary course in United States history should come a regular course in general history. This should include ancient history, with special attention to the Hebrews, Greeks, and Romans, from whom so many elements of our modern civilization are derived, the mediæval history of Europe,

and so much of modern history as is necessary to complete the preparation for the intelligent later study of the history of our country. Between this general course and the final study of our own history should intervene a more complete study of English history, because from England we have derived our language, so large a part of our most valuable literature, and so many essential features of our social system.

SPECIAL FEATURES.—By the time pupils are ready to take up this general course of study, they are prepared to enter more deeply into the problems of social evolution. More stress than before should, therefore, be laid upon location and topography and upon the logical sequences of events and social conditions. The geographic studies incident to historical scholarship should include the effects of climate upon racial temperament and activity; the physical conditions favoring or hindering intercourse with other peoples; the relief forms in their relation to phases of social development; the agricultural and other physical resources in relation to the number and wealth of population and to the development of the arts and sciences. The systems of government and the character of the other social institutions should be made very plain, as should also be their genesis.

DRAWING OF MAPS.—The skill in drawing by this time acquired by the pupils can be made very useful. More map-making may be required, and of a superior kind. They may be utilized as a means of registering the knowledge acquired. Beginning with the outline of a country and the adjoining regions, the topographic features and historic events connected with them may be indicated as they are learned, and the maps thus completed and made significant as the lessons advance.

PICTURE-MAKING.—Picture-making may be employed with equally good results. The study of general history takes pupils back to remote times in distant lands, and introduces them to people strange in appearance, costume, modes of life, and the development and application of industrial and artistic skill. The drawing of pictures, therefore, may give reality through the hand and the eye to that which otherwise would be vague and unreal.

Pictures made by the pupils, of Roman armor, weapons, military insignia, and musical instruments, together with diagrams of the camp, the line of march, and the line of battle, may flash before their eyes the Roman legions that once made the earth tremble beneath their tread, compelled the barbarians to assume the semblance of civilization, and wrested from the Greeks the wealth of their culture to bestow it liberally upon the peoples of the West. So pictures of Greek statuary and Greek temples may make the Acropolis again a thing of beauty and a source of inspiration.

WARS.—So far nothing has been said about the study of wars. There is a growing tendency to slight it, because of increasing aversion to war and the conviction that it is a crude and barbarous method of settling social wrongs and misunderstandings. The study of history, however, has not for its primary purpose the gratification of a sentiment or the support of a conviction; it is an effort to learn what organized society is and how it was evolved. The study of wars may be rationalized, but it may not be omitted. The fate of a nation has often depended upon a battle, and wars have largely determined the progress of civilization. The Revolutionary War won our independence, and the Civil War regenerated the nation.

With all that may be said, too, of the horrors and savagery of fighting, it still remains true that horror and savagery do not make up the whole account of it. One of our priceless heritages is the memory of the brave deeds and heroic sacrifices of our fathers upon the field of battle, and we would not be faithful to them and our country if we did not transmit it to the next generation. Nothing could more impress us with the sacredness of the nation's life and the exalted character of civic duty than the precious blood that has drenched our soil.

The Later Study of United States History

After the course in general and English history, pupils are sufficiently mature in mind and well enough furnished with knowledge to study the history of their country with more thoroughness, deeper comprehension, and greater interest than before. The earlier study was an appeal

principally to memory, imagination, and sympathy with the great interests of humanity. These elements must not pass out of the work, but there must be added a strong appeal to careful thinking, to logical reasoning. Later study must be more like the working out of a complex problem, a very fascinating problem in social development.

THE CENTRAL INTEREST.—No history can be more interesting to the true student than ours. Never before has so large and powerful a nation been so thoroughly amalgamated out of so many diverse elements and attained unto such material and spiritual wealth, so large a measure of liberty, and done so much in so short a time to advance the welfare of humanity the world over. In these great results from such humble, varied, and otherwise unpromising beginnings, lies at once the truly romantic glamour of American history and its appeal to reason. The interest, therefore, will centre in efforts to understand: first, our territorial expansion and corresponding increase in population; second, our growth in nationality; and third, the changing status of the individual citizen.

THE INCIDENTAL INTERESTS.—The matters that in the end are logically of most importance, do not assert their importance until the end. There are many others that first lay hold upon the mind. They are the events and conditions incidental to our expansion; the development of industry and commerce, the wars of our people, migration and immigration, the growth of religious and educational institutions, the making of our literature, and the changes in our political institutions and parties. All, or nearly all, these things were studied before, but they are made new by the pupil's new point of view and his ability to organize his knowledge in newer and deeper relations.

DISCOVERY AND COLONIZATION.—The discovery of America was an accident, but the voyages that ended in the discovery were not accidental. The basic problems of society, as of the individual, are the problems of subsistence. The primal needs of the race are food, clothing, and shelter. These needs may be enlarged to include luxuries, ornaments, and conveniences. When a region becomes deficient in any of these needs, its inhabitants must either move elsewhere or import needed goods from

other lands. For centuries the countries bordering on the Mediterranean had traded with the Far East. This trade was possible only along routes determined by unchanging physical conditions. They were old and well determined. The Mohammedan Turks made commerce over these routes nearly or quite impossible for the West, and menaced its wealth and comfort. The thing sought was a new trade route to India and China, and the proper introduction to the study of discoveries in America is a study of the commerce of the Mediterranean countries, made definite with maps that plainly chart the ancient trade routes.

The theory that led Columbus to seek the East by sailing west, caused his voyages to conform to the general law of racial movement along lines of latitude, though they were thrown southward because he began his first westward journey from the Canary Islands, the last known port in which to refit his ships. The other Spanish and the Portuguese explorers, in the main, followed him. Explorers from the more northerly European countries just as naturally found the lines of effort between the Spanish possessions and the forbidding regions of the Far North. The colonists followed the discoverers, and so the settlements in America became identified with so-called Aryan racial movements which began many centuries before in Asia. They peopled Europe, they have swept in resistless tides across the American continents, and the end is not yet. The most energetic of the race have projected themselves beyond the continents, gained the mastery of the islands of the Pacific, are meeting with others of the race turned back eastward, and with them are urging their way among the inert peoples of the East to work results in civilization that even yet can be only imaged in dreams.

THE COLONIES.—Inasmuch as the thirteen original colonies were the units that combined to form the nation and give it its fundamental characteristics, the pupils should be made well acquainted with essential features in the social life of each one. They should know definitely the racial peculiarities of each, its form of government, its dominant type or types of religion, its social customs, the distribution of its population, its educational institutions,

its productive industry, and its commercial interests. They should also study the conditions in Europe that urged the colonists to leave the homes of their fathers, brave the perils of the deep, and engage in the arduous and sacrificial struggles for homes in the wilderness of a new world.

All these things are not only interesting, they are also illuminating. They help us to understand the relation of the colonies to one another, to their French, Spanish, and Indian neighbors, and to the mother country. Beyond this, they help us understand the character of the nation and the temper of its people.

IMMIGRATION AND ANNEXATION.—The principles that govern intelligent study of the colonies must largely direct the study of all additions of large bodies of foreign peoples, because they radically modify the nation's life, no matter how marvellous may be its power of absorption.

It is easier to do this than appears at first sight. The annexations, of course, have been definite enough: the French colonies along the Mississippi and in the Northwest Territory first; the Spanish colonies in the Southwest and California next; after that, Alaska; and last of all, the Canal Zone and the island possessions. The immigrations, however, are not so simple, yet they have, in the main, distributed themselves over fairly definite periods and first affected fairly definite localities.

In the decade between 1840 and 1850 began first the great influx of the Irish, mainly into New York and into the coal fields of Pennsylvania. Close upon their heels came the Germans, because of the revolutions in the home country and the compulsory military service. These were closely followed by the Scandinavians, the Welsh, and with these always a sprinkling of English, Scotch, and Dutch. In thirty years these waves of immigration largely spent themselves, but they brought into the country much of its best new blood. Afterwards came, practically in the order named, the French-Canadians, Poles, Slovaks, and kindred peoples, followed by Jews, Italians, and Greeks.

Until after the Civil War these movements of population were spread over the North and West through New York harbor as a gateway, and largely because of slavery in the South.

The strength of the Catholic church in the old Puritan states, and of the Lutheran church in the northern states of the Middle West, gives some hint to the student of the profound way in which these new citizens have affected our social life.

LINES OF EXPANSION.—The teacher of United States history should freely use maps especially made to indicate the accessions of territory and the routes followed by the expanding population, and require such maps to be made by pupils.

We all know that the course of empire takes its way westward, but we do not always ask why this is so, nor why the general law is often broken. The Aryan races have done the westward marching, and they have done it for two reasons. People naturally cling to the climates to which they have become habituated, and the principal mountain ranges of Asia and Europe extend east and west. Europe opens to the west and pours its ambitious surplus of people on the eastern shores of America.

Here the continental formation is different, and the difference will some day be momentous in influence on the race. Here the mountains range north and south. This does not in these days of steam and electricity mean what it once did, but the facts of to-day must not close our eyes to the facts of the past. The mountains were barriers, and only breaks in the ranges conspired with the waterways to continue the western progress of civilization in our country. Our main tributary rivers flow east and west. So the progress of migration in the North was at first mainly through the Mohawk valley, along the lakes, the Ohio River, the Missouri, the Platte, and Kaw, to the breaks in the mountain walls of the Rockies. The great overland trail extended from the Missouri through Kansas, Nebraska, and Wyoming, sending one branch northwestward into the Oregon country to meet the rivers there, and another through Utah into California. Other breaks there are in the mountain ranges that have served as historic passes, but in our early history they were secondary. Such were the Wilderness road blazed by Boone, the road to Fort Pitt surveyed by Washington, and the southern trail to California. Each demands attention,

for each contributed in its own way to our development as a people.

The next great fact to emphasize is that our main valleys extend north and south, and so most of our great trunk rivers flow southward. More and more this will help to make our people the wonder of history, the most homogeneous of all the great nations in spite of our heterogeneous origin.

Even before the Revolution, Germans and Scotch-Irish from Pennsylvania and Germans from western Maryland and northern Virginia moved southward through the Cumberland valley in Pennsylvania and the Shenandoah valley in Virginia until they met and mingled with Scotch-Irish from the Carolinas in eastern Tennessee, which is mainly Presbyterian and Lutheran to this day.

Similar movements took place in the Mississippi valley. The French from the settlements in Louisiana moved up the river towards Canada, and the French from Canada moved down the river towards Louisiana, and so French settlements were strown along the way.

Another famous highway that mingled people from the North with people from the South, was the Santa Fé Trail through Kansas into New Mexico.

The Making of the Pathways.—The great highways over which our people moved in the building of the nation were supplemented by many others. It is interesting to note that they were ready made, so natural were the routes, and that our growth has been determined through ages by the configuration of our country.

When settlers began to move back from the seaboard, they followed in the footsteps of hunters, trappers, and traders, who in America early became the forerunners of civilization. These in their turn walked in the footsteps of the Indian, and the Indian for centuries had moved along the game trails of wild animals. So the highways were either waterways, paths along them, or well-worn trails from water to water, from pasture to pasture. So the instinct of the wild animal anticipated the science of the surveyor.

Slavery.—Slavery was the settlement among the population of compulsory immigrants. It was the in-

troduction of people foreign not only with respect to the land of their origin, but in color, and in everything that may be summed up in race experience, and it placed them in a social position different from that of any other part of the population. It demands much of the teacher's attention, because it has so profoundly affected our history and will continue to do so for good or ill as we are wise or otherwise.

It became confined to the South, not because the South deliberately accepted it and the North deliberately rejected it. It gradually disappeared from the North, and almost as gradually fastened itself upon the South, like a disease.

In the North the Puritan temper in New England did not lend itself naturally to slavery, and the Quakers and Germans in Pennsylvania early declared against it. So there were no doubt more opponents to slavery in the North than in the South, though the South had its opponents as well. There was this difference. In the North, the land and the climate favored the small farm, and the small farm makes the working farmer and the working family, and makes them democratic. So the influence of the opponents of slavery finally prevailed throughout the North.

In the South, the land and the climate favored the large estate except in the mountains, where slavery never became well established. The large estate demanded cheap labor. Tobacco, rice, and especially cotton after the invention of the cotton gin, made slave labor profitable. The labor of the slave made hired free labor impossible. The planter opposed to slave labor either swallowed his opinions and feelings or went out of business. And so in the South, slavery became established and accepted as a necessary institution.

Slavery thus came to divide our country into two sections with opposing civilizations. As the civilized world grew away from the South, the South became solidified more and more into a mediæval form of society. The people were divided into fairly distinct classes. The planters and professional men formed the highest class, the business men and trained mechanics formed the next class, the white laborers in the towns and small farmers in the hills formed a still lower class, and the slaves were,

of course, the lowest of all. The planters governed the policies of the South and became by profession politicians. Through education and the power acquired by continued service they not only ruled their own states, but also had dominant power in the national government for years at a time. Slave labor made the mine and factory impossible, and the class-divisions of society engendered by it made the public school and general education a thing of the future. So slavery turned immigration northward and westward, kept new blood out of the country, the South became limited in ideas and enthusiasms, developed no literature of deep or lasting value, and so delighted itself, if it would, in the things of a time that was past.

As anti-slavery sentiment grew, slavery was placed more and more on the defensive. Its refuge for years was in the Senate. As long as a slave state could be added to the Union for every free state admitted, slavery could maintain equal power in the Senate, and so largely dictate legislation. When the southern lands were exhausted and the lands in the northwest made new free states, then the inevitable occurred: war came. That war baptized the land with blood, and in the baptism we were born a new nation; and the South was made a new South, infinitely richer in material wealth and more influential in the finer things of civilization than the old South could have been.

Our Wars.—When wars are studied, the causes and results are matters of most importance. When the progress of a war is itself the subject of study, the whole theatre of it must be studied with reference to the objectives of the campaigns. This can be done well only with the aid of maps that plainly give the geographic features that determined the plans of the campaigns and contributed to their successes and failures. If wars are not so studied by campaigns, they do not appeal to the intelligence, and the minds of the pupils are burdened with unorganized materials hard to remember.

The objectives of the English in the French and Indian War, for illustration, were the capture of Fort Pitt, Niagara, Crown Point, and finally Quebec. It is easy to see why, when the geographic features of the country involved are well known. Fort Pitt commanded the use of

the Ohio River and meant control of the Ohio lands. Niagara dominated Lake Erie. Crown Point controlled the easiest route that connected the Canadian settlements in the valley of the St. Lawrence with the English settlements along the coasts, and easy routes are very important in war. Armies must move, baggage and ammunition must be transported, and lines of communication must be kept open for the renewing of supplies. The route that was so important both in the French and Indian War and in the Revolution, had for its features the Sorel River, Lake Champlain, Lake George, twelve miles of plain, and the Hudson River.

The capture of Louisburg brought with it the mastery of Nova Scotia, and of Quebec, the ownership of Canada.

The study of the Revolution can be simplified by remembering a few things. The British armies were dependent for reinforcements and supplies mainly on the mother country. The seaport cities were vital in their importance for them. These ports were Boston, New York, Philadelphia, Charleston, and Savannah.

All the roads in eastern New England radiated from Boston or connected such roads. These roads extended mainly through forest, and passed through cleared farm lands surrounding small villages. There were no factories. In commercial matters all the region was dependent on Boston, and outside of Boston no large army could be maintained for any considerable length of time in eastern New England except through Boston.

In a similar manner western New England, New York, northern New Jersey, and northeastern Pennsylvania were dependent on New York City; and Philadelphia, Charleston, and Savannah dominated large regions adjacent to them.

The Revolutionary War can, therefore, very simply be summed up in efforts to capture or hold Boston, New York, Philadelphia, Charleston, and Savannah, Burgoyne's campaign along the old route from the Canadas in an effort to separate the New England colonies from the others so that the country might be subdued in sections, and the forlorn-hope campaign of the British in Virginia. All other events were incidental.

Battles which contributed vitally to the results of campaigns and wars, necessarily demand attention. Some should be fully studied also because they reveal the genius of great commanders and the heroic devotion of patriotic men. The knowledge of their deeds may inspire the young to emulate their example should occasion demand.

INDUSTRY, COMMERCE, AND TRANSPORTATION.—It is generally recognized that the extent of our country and the vastness of its resources are the basis of our growth in numbers and in wealth and in power. What is not so generally recognized is that the development of these resources is not a purely incidental matter to be disposed of in the study of our history with a few columns of statistics. It has not only increased our numbers, but it has also changed the character of our population, and modified every phase of social interest and activity.

Our industries are governed by certain natural laws. We have already made some note of the industries of New England. Her factories first used her water-powers. The attention of the people was directed to these at first chiefly by Jefferson's Embargo Act, which checked seafaring and commerce. When the introduction of steam and the modern demand increased the New England factories in size, number, and variety, they stimulated immigration. So the occupations have been changed, and politics, religion, and education have been modified accordingly.

Different sections of the country have developed their industries in different order, depending on circumstances. In Pennsylvania the farmer and lumberman added to their company the miner, and the miner brought the manufacturer. On the high plains between the Mississippi and the Rocky Mountains, the hunter and trapper were followed by the cowboy, the open range gave way to the fenced ranch, and where the irrigating ditch has come, the cowboy and the ranchman have given way to the farmer.

The development of industry has created demands for improved means of transportation and numberless inventions. These all have come in due time and place. The steamer has taken the place of the flatboat as the flat-

boat took the place of the canoe; the canal paralleled the river and displaced the portage; and the railway train has displaced the freight wagon and coach on the old trails of the deer and buffalo, of the Indian and white hunter. All these things must be told in the story of our country's growth, and they help to make the telling interesting.

EDUCATION, LITERATURE, AND ART.—Our schools have likewise changed in number and character with the growth of population and industry, so that there are no other schools just like them anywhere else in the world. They are democratic as the people, and are designed to give the largest opportunities of life to all.

Public schools began almost with the settlement of our country. The Dutch brought the idea from Holland, where it began with the effort to make Bible reading universal. The Puritans in Massachusetts had the same desire, and they had an added incentive. The leaders were university men. They founded Harvard College as soon as the settlement was established, and they provided for primary and secondary schools, largely to support it.

Public elementary education spread rapidly over the North and West because of the demands of American democratic citizenship for intelligence and character, because of the need of Americanizing the children of immigrants, and because of the opportunities that in America come to the educated. For similar reasons the public secondary school quickly followed, and has had a development as nowhere else in the world.

The settlement of the West on lands owned and granted by the national government gave rise to state institutions of learning, and the mines, factories, farms, railroads, and mechanical inventions for the application of steam, electricity, and water-power have given rise to modification of courses of study for different kinds of technical and industrial education. As a climax has come a university of a type peculiar to ourselves, and it is backed by wealth never before heard of.

Before the Civil War the South depended mainly on private tutors and private schools for its elementary and secondary education. For its higher education it depended on the colleges in the North or the universities of Europe.

Now it is making wonderful progress in all the phases of modern education.

Literature and art are forms in which nations express their thoughts and feelings. Every nation makes a literature and an art peculiar to itself, and these vary in quantity and quality in the different periods of a nation's growth. These must, therefore, be studied not only as a part of the history, but also as revelations of historical facts of the highest order, the inner secrets of the nation's life. Randall's " Maryland, my Maryland! " is not only a Southern poem made in the South at a certain time but it is also an expression of the mind of the South at that time, as was testified by its popularity. It tells very plainly why the South seceded and why it fought so long and stubbornly, without really setting out to do so. It is in remarkable contrast with Julia Ward Howe's " Battle Hymn of the Republic," which just as truly expressed the most serious Northern thought at the time.

GROWTH IN NATIONALITY.—Three things in the early history of our country are to be specially noticed in their relation to the character of our nationality and to its development. The first is that in spite of the diversities of race and religion in the original colonies, similar social and civic ideas and ideals were impressed upon them by England, the most advanced in democracy of all the countries of Europe, and the most practical in the management of government matters.

The second is that the Appalachian Mountains and the forests conspired with their dependence on England to confine the settlements to the seaboard long enough to develop a distinctive American spirit and a certain homogeneity of social customs and administration of social business.

The third is that when population once began to move beyond the barriers and spread irresistibly over the continent, the native born or earlier settlers led the way and determined the basic character of the new settlements.

In spite of the community of spirit and customs, how deep was the feeling of antagonism and jealousy and independence that separated the colonies one from the other, may be inferred from the failure of Franklin's plan to

form a confederacy for more united action against the French and Indians. However, we are now a nation, and the events that did most to make us one should be carefully noted.

The principal ones given here will serve as a guide. The Indian wars in New England allied the colonies there. The French and Indian War caused men from different colonies to fight under the same flag for a country rather than for a colony. The grievances of the colonies against England compelled union and led to the organization of the Continental Congress. The Revolutionary War developed a national sense with its community of heroic action and sacrifice. This was strengthened by the failure of the attempts at government under the Articles of Confederation, and so was made the attempt to form a more perfect Union through the Constitution. When slavery divided the Union into two sections, it solidified the sections as the country, and no part of it, had been solidified before, and when the war destroyed the causes that separated the sections, we were born again a nation more perfectly joined together than any other in the world. Incidentally also, our tariff laws have cultivated a national sense. Last of all, this sense of nationality has been intensified by the Spanish-American War and the resulting possessions.

To this list must be added as a factor peculiar and powerful, the acquisitions of national territory that became incorporated with the rest of the country, like the Northwest Territory, ceded by Virginia, and the Louisiana Purchase. The new settlers in the territories were in a relation to the nation very different from that of the people in the original states.

THE STATUS OF THE INDIVIDUAL.—The status of the individual has changed just as much as the Union, but the changes are not so easily followed. When the Constitution was adopted, no state had manhood suffrage, and the election of senators by the Legislature of the states and the selection of the President by an electoral college show plainly that it was not thought wise to entrust the choosing of such important officials to the intelligence and character of the citizens generally, however limited might be the right of suffrage.

The right to vote was determined by religious or property tests or by combinations of the two. Offices, too, were not open to all voters. Right to hold office was more limited than the right to vote by increasing the property requirement or by making the religious qualifications stricter. The spirit of the Revolution soon began to remove these qualifications, but full manhood suffrage began with the admission of Ohio. In the pioneer struggles of the new states our democracy was perfected, and in the West also began the extension of the suffrage right to women.

TIME TO TEACH.—Inasmuch as this growth of nationality and individuality and the changes in the relationship of the states to one another and the nation have come about in a natural way, they must properly be studied in the sequence of their occurrence. It is ridiculous, therefore, to study the Articles of Confederation and the Constitution as appendices to our history. All important changes in the government, both in fundamental law and in method of selecting candidates and electing officials, whether adopted by legal enactment, judicial decision, or by the people independent of both, should be presented to the pupils as they occurred. They came not by chance, but were the products of existing conditions and revelations of the pulsing life-blood of the nation.

All the basic questions of our civil life have been questions of the status of the nation, the state, and the individual, and concerning such incidental economic problems as the tariff and the relation of the employer and the employees. These questions have given life to our political parties, so the study of these must go on side by side with that of the other phases of our life. Only so may we come to learn our history in a useful way.

OUR LATER HISTORY.—Pupils capable of the advanced course outlined are ready to study with intelligence our late development of business, trusts, and labor organizations, and the influence of these upon our social life. They are also ready to consider the accomplished and possible future results of the acquisition of possessions beyond the seas. This suggests another valuable feature of good work in history. Because there is much room for dif-

ference of opinion on such subjects, they may profitably be debated in class. Throughout the course, in fact, debate may often be employed as a means of arousing interest and making knowledge clear and definite.

INTENSIVE STUDY.—The Committee of Ten appointed some years ago by the National Education Association recommended that the last year in history be devoted to the intensive study of some particular period or periods. This would be very valuable not only as a source of knowledge, but also as a means of mental discipline. It would require pupils to hunt up and make themselves familiar with source materials, weigh testimony, discriminate between the valid and significant and the invalid and insignificant, and make reasonable and useful generalizations. Wherever the school library makes this possible, it should be done.

CHAPTER XX

MATHEMATICS

OBJECTS are known to us as they either do or may affect our senses, that is, by their qualities. In so far as they may be considered as closely related or separated because of similarity or dissimilarity of qualities, they offer us materials for different descriptive sciences. But they may also be known as grouped, or repeated, and as extended, that is, as having length, breadth, and thickness, and as offering resistance. As they are known to us repeated in groups, or as extended, or as offering resistance, they incite the mind to acts of measurement in different forms, to the development of another phase of knowledge, *quantitative* knowledge.

QUANTITATIVE KNOWLEDGE.—This quantitative knowledge is very important, because for many practical purposes in the arts, sciences, and exchange of commodities, it enables us to give to the objects of knowledge and use definite values, and makes both knowledge and practice exact and economic. So the mechanic measures the parts of the machine he fits together and measures the work it can do; the engineer measures the length and grade of his road; the chemist, the proportions of the ingredients that will produce a certain compound; the geographer, the height of the mountain and width of the plain; the merchant, the quantity and value of his goods; the farmer, the size of his farm and quantity of his crops; and his housewife, the butter and eggs she can take to market. Such measurements make possible the exact adaptation of means to ends, and thus prevent waste and failure of effort.

This quantitative knowledge is important for still another reason. In all knowledge the mind reveals the dignity of its being by placing its own interpretations according to its peculiar purposes on the facts which challenge it to action; but in no other form of knowledge does it so independently assert its inherent character as it does

in determining quantitative facts and relationships. It selects its own standards of measurement, it fixes its own conditions of combination. These combinations, therefore, are governed by laws which its own nature makes necessary, and the results are definite and sure. In consequence, no other sciences give similar opportunities for training in careful, exact, logical effort as do the *mathematical* sciences, the sciences of measurements.

Relative Value of Mathematics.—It is easy to underestimate the value of mathematics. For practical purposes most people need the mastery of only a few simple mathematical operations. Even in scientific and professional applications of mathematics, each particular worker needs but a few formulæ. Mathematics, also, is singularly destitute of the elements that enter into and inspire æsthetic and ethical ideals and enjoyments.

It must be noted, however, that the simple operations which most people are compelled to use represent the perfected thought of the race on these subjects, and are the achievement of many centuries of intellectual effort of a high order. The formulæ become intelligible and effective only through long, patient, and arduous training.

The knowledge acquired in other sciences, because of its wide range and incompleteness, tends to make the student satisfied with the vague and indefinite and accustom him to careless and inaccurate observation. The masses of fact they present distract the mind from the effort of reasoning, and the possibility of undiscovered elements is apt to cast doubts upon the results of reasoning and so discourage it. The student, therefore, constantly needs his mathematical training not only for its immediate use in measurements, but also to supplement the other sciences in the process of his mental development, to help him preserve his mental balance, to keep him alive to the value of demonstration, and to habituate him in patient thoroughness in all his thinking.

Guarantee of Results.—The good results to be derived from mathematical study do not come because of some magical power inherent in the subject. Only skilful and enthusiastic teachers secure them. A lesson in arithmetic, algebra, or geometry may be learned by rote

and be repeated as mechanically as in any other branch of knowledge, and the written statements may be destructively slipshod and careless. To make the student strong in reason, the teacher must require him to gain his solutions by reasoning; and to make him skilful in the applications of his mathematical knowledge requires constant and intelligent drill.

Arithmetic

THE DEFINITION.—A definition is generally a bad thing to teach from, but it may be a good thing to teach up to. It always is when it keeps the teacher in mind of the results to be accomplished with his work. The old-time definition is a helpful one, especially for the young teacher: "Arithmetic is the science of numbers, and the art of using them." This will help him to avoid the inexcusable pedagogical offence of converting what should be the study of a dignified and fascinating science into a merely mechanical manipulation of figures, and the equally inexcusable offence of sending forth from school pupils improperly equipped for the practical duties of life. The first offence often leads pupils to seek artificial helps to the solution of problems, and the second robs them of the most vital incentive to effort.

NUMBER.—Number is not a thing like a table or chair or dog that may be known by sight or touch or any other sense, nor does it belong to any object or combination of objects as we think of qualities belonging to them. It is a resultant of a complex mental process, or, better perhaps, it is a complex mental process, concerning objects or acts, or performed in the abstract by means of symbols. It is the "how many" of a group of objects or series of acts, or the "how much" of a quantity of material. The steps in the process are *generalization, discrimination,* and *relation.*

Generalization.—The place of generalization in the complex of processes may be made plain with a problem like this. Find the sum of six cows, three elephants, and five cats. At first sight this seems absurd. The request, however, is not impossible of fulfilment. The moment the cows, elephants, and cats are thought of as animals, the

problem is converted into six animals plus three animals plus five animals, and the result is fourteen animals. Always when we number, the objects numbered form a group or series on the basis of common features, or attributes. Without the ability to recognize the resemblances of objects, it is impossible to number. That is the ability to *generalize, to form concepts.*

Discrimination.—From the observation of small children, the second element of the process may be learned. After they can count seven or eight objects accurately when they are so placed that they can easily be kept separate, it frequently happens that they cannot definitely determine the number of even a smaller group of objects when closely or irregularly assembled. Grown persons meet with the same difficulty when they attempt to count stars in the sky, birds in a flock, or animals in a herd. It is necessary not only to *generalize,* but to *discriminate,* to keep distinct from one another the members of a group.

Relation.—The third step consists in putting the distinguished members of the group into such orderly arrangement that it becomes, in a way, so many repetitions of one, a sum. This is *relation.*

It is evident that even simple numbers require considerable power of attention and a fairly high degree of mental development. It is not surprising, therefore, to learn that many savage tribes are unable to count beyond five, and that some do not seem to count beyond four.

Units.—When numbering to determine the size, or measure, of a collection of objects or to make up a collection of a given measure, the member of the group, or set of members, used as the basis of measurement is called the *unit.*

These units may be either indefinite or definite. They are indefinite ordinarily, when we seek to ascertain the "how many" of a collection of things, like apples or potatoes. The unit then is either an apple or potato just because it is like the rest of the collection in being an apple or potato, no matter how it may differ from them in size, shape, or weight.

Definite units are employed to determine the "how much" of a thing or mass of things. In this case the

thing or mass is thought of as made up of parts measured by standards homogeneous with the quantity to be measured. So we measure land by acres, sticks of timber by feet, cloth by yards, money by dollars, potatoes by bushels, coal by tons, and sugar by pounds. These definite units, acres, feet, yards, and so on, are themselves measured by proper subdivisions of themselves. Thus feet are measured by inches, tons by pounds, bushels by pecks, and pecks by quarts. So arithmetic, which is defined as the science of *discrete* quantity, is made to apply to *continuous* quantity, for the question *how much* land or coal is answered in terms of *so many* acres or tons.

Composite Units.—It is apparent that an object is not *one* because it is an object, but because it is thought of as a unit or possible unit of numerical measurement. It is a unit as a standard of measurement, and this standard is not necessarily a single thing. It may be a group of things. The merchant measures his eggs by dozens. We all may count our hundreds by tens and our thousands by hundreds. So the dozen, the ten, and the hundred become units, *composite* ones.

Fractional Units.—Units like one, dozen, and score are *integral* units, but there are still others. Inasmuch as objects and groups of objects may be divided in many ways, it is often convenient to measure quantities with parts of units; this gives us fractional units like halves, thirds, and quarters.

Purpose of First Lessons.—Naturally the first effort with a primary class in arithmetic is to develop basic numerical ideas. As we have seen, number is the measure of a collection of objects; and it is only by numbering objects, by efforts to discover the numerical relation of objects to one another, that children can form and perfect their first ideas of numbers.

The practical suggestions for first lessons must come from the children themselves. While their field of interest is different from that of grown people, they have similar incentives to urge them to number efforts. The principal ones are the happiness of possession, the need of adapting means to ends, and curiosity. They are eager to know how many marbles or pennies they have,

how long a board must be that may be used in repairing a sled, whether they have money enough to buy a desired book or pair of skates, the scores of a base-ball team, or the number of successful rope-skips.

First Lessons.—It would seem best to make the first lessons consist in numbering things by ones up to twelve or fifteen. They should extend to twelve at least, because so much familiar numbering is by dozens, and several things that children should learn early involve the number twelve even when they are not counted by dozens. These are, for instance, twelve hours shown on the clock; there are twelve months in the year, and twelve inches in a foot.

It is a very easy matter to find materials for number exercises. Three lines are necessary to form a triangle, four are necessary for a square or any other rectangular figure. Children gather flowers, and flowers have three or four or six or eight or nine or twelve petals. They are also eager to know how many kinds they have found, or how many they have in a bunch. They have five fingers on one hand, and ten on the two. Their thumbs have two joints, and their other fingers have three. They can count a needed number of crayons out of a box, the number of boys and girls in the class, the number of times they clap their hands, or the number of movements they make in their gymnastic exercises.

They can measure the number of quarts or pints the water pail will hold, how many pints or quarts there are in a gallon, how many feet the blackboard is long, how many feet or yards the room is long and wide, and how long and wide are the pieces of wood and paper they use in their constructive work.

The teacher who cannot put life and profit into these first exercises is surely to be pitied.

Content of Number Concepts.—The ability to count a given number of objects out of a box is but the beginning of a knowledge of that number. The facts that may be learned concerning so simple a number even as four, make a list of respectable length.

Four separate objects of any kind grouped together make a sum of four: that is, $1 + 1 + 1 + 1 = 4$. Add-

ing two of a kind to two more of the same kind, or one of the kind to three of the kind, or three to one, also makes sums of four: $2+2=4$; $3+1=4$; $1+3=4$.

If one be taken from four of the kind, there will be three left; if two be taken, there will be two left; if three be taken, there will be one left; if first one and another be taken, there will again be two left; if one and another and still another be taken, there will be one left: that is, $4-1=3$; $4-2=2$; $4-3=1$; $4-1-1=2$; $4-1-1-1=1$.

Twice two are four, so there are two twos in four: $2\times 2=4$, and $4\div 2=2$. So also $1\times 4=4$; $4\div 1=4$; $(1\times 3)+1=4$; $(3\times 1)+1=4$; $4\div 3=1$ with 1 remaining.

Still further, if a group of four things is doubled, there will be eight, $4\times 2=8$; if it be trebled, there will be twelve, $4\times 3=12$. There are eight halves in four, twelve thirds, and sixteen fourths.

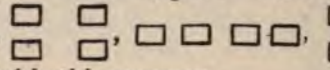
Exhaustive Teaching.—It is sometimes claimed that children should learn all about four before they are taught five, all about five before they are taught six, and so on. This harmonizes neither with sound theory nor with good practice. It is somewhat like trying to teach all about a lily before teaching anything about a rose, and all about a rose before teaching anything about a sunflower.

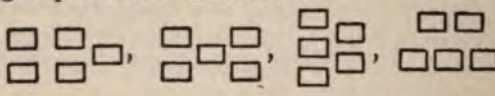
The fact is, that there are some things concerning eight that are more easily and naturally learned by a child than some things about five. The study of four prepares it to learn them more than it prepares it to learn the five.

The Method.—In primary work as many lessons as possible should be so planned that the numbering is as interesting and urgent in an incidental way as it is in the games and occupations of children; but they cannot all be so planned, and it must not be thought that the discovery of numerical relations is not of itself interesting. Even formal exercises with objects may be lively and enjoyable, and there are many ways to make them so. A few exercises may be suggestively helpful.

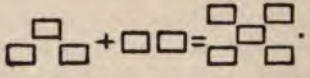
Three flowers placed in line one after another a few inches apart in this manner, , may be

used to make a lesson on $1 + 1 + 1 = 3$. Two flowers placed by children in this position, , with another placed above in this position, , may make a lesson in $2 + 1 = 3$; and another lesson, by having one of the flowers removed, may be made in $3 - 1 = 2$; and still another may be made by having two of the flowers removed, $3 - 2 = 1$.

In all the exercises with simple numbers of objects grouping may be made helpful. Four objects may be grouped thus,  ; five may be grouped in this manner:



The signs of operations may be gradually taught by having the pupils draw pictures of objects, using the proper signs to indicate the process and result, as



Simultaneous Operations.—In the exercises suggested in the foregoing paragraphs it is assumed that addition and subtraction are to be taught together. Some teachers prefer to teach all the four fundamental operations, addition, subtraction, multiplication, and division, together. This can be done, and there has as yet been made no measure of results sufficiently accurate to prove conclusively that it cannot be done economically; but after all there is a difference between two added to two and two used twice, that is, multiplied by two, and it would seem, on abstract grounds, better to keep the processes separate from the beginning, no matter how closely related they are. The difference between them becomes apparent in the larger operations: $462 + 462 + 462 + 462 + 462 = 2310$ is not the same thing as $462 \times 5 = 2310$.

TEACHING MULTIPLICATION AND DIVISION.—First lessons in multiplication and division are easily planned. Have pupils, for illustration, place first one set of two marbles on the table or desk and another set of two close by, . Ask them to tell how often they have put two marbles in place, how many the twice two, or two times two, marbles are. The reverse of this process is the beginning of lessons in division. Have the pupils place the four marbles together. Have them take away a set of two and form a set with the remaining. How many sets of two can be made with four marbles, or how often are two marbles found in four?

THE WRITING OF NUMBERS.—If the first number work is done in the first grade, there should be no writing of numbers for several weeks, in order to keep the attention of the pupils fixed upon the numbers themselves; but if systematic number work is deferred until the second year, as is frequently and with some reason done, writing may begin almost immediately.

When writing is begun, there is no good reason why it should be approached in a roundabout way. It is not necessary to have the pupils write two marbles first, and then substitute the figure 2 for the word two and require them to write it again 2 marbles. An expression like 2 lilies + 2 lilies = 4 lilies is arithmetical, and is the proper form for the arithmetic class.

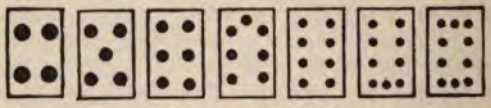
THE ARABIC NOTATION.—Possibly the greatest of all arithmetical inventions was that of the Arabic system of notation. The decimal system of numeration came early. It originated from using the fingers as counters, there being 10 fingers on the two hands. There was an earlier system of counting by fives, the number of fingers on one hand. A trace of this is still found in the Welsh way of counting fifteen-one, fifteen-two, and so on to twenty.

There was an interval of hundreds of years, however, between the invention of the decimal system of numeration and that of the decimal system of notation. Until the latter was made, arithmetical calculations were inconvenient and difficult and the progress of the science slow. So the decimal system came as a great boon to the race, and the principle of it should be taught children early.

As soon as they study ten, to learn more of it than they do by counting out ten objects, they should learn to know it as a possible composite unit. They can do this by making bundles of ten splints each, or by making collections of objects like buttons or marbles or beans in small boxes. These boxes and bundles can be counted as easily as single sticks or buttons, or very nearly so, and the act means much more. It is the proper introduction to eleven, twelve, thirteen, fourteen, four and ten, twenty, two tens, thirty, three tens, and so on.

It is easy to see that this is a proper introduction to the understanding of the notation when the time comes for the understanding. A bundle of ten splints with two separate ones will make plain the place value of the 1 in 12 and the use of 2 to indicate the units, and this will lead to a knowledge of the use of the 0 in 10. All will become plainer still when combinations like 22 and 32 are taught in a similar manner, and light will be thrown on many fundamental operations.

Drill in Number Recognition.—For supplementary drill in the ready recognition of numbers involving rapid addition, it is well to prepare cards by pasting numbers of colored disks of paper upon them in this wise:



Such cards may be shown to the class for a moment and quickly reversed and the pupils given opportunity to tell how many disks are on them.

Concrete Work of Second Year.—The systematic teaching of number combinations with objects, commenced the first year, should be continued the second year to twenty, or perhaps twenty-four, two dozen. There may be some lessons in numbers also beyond this, because the numbers grow by tens and units as they do from ten to twenty, and a few of them are of use even to children so young.

This year may gain interest for the number pupils from exercises in denominate numbers. Pounds and ounces may be learned by weighing things and materials,

and there may be much measuring by feet, inches, and yards.

Lessons with coins the first year should be lessons in perception and counting. The child may know a dime by sight and its purchasing value for some things quite a while before he is ready to be taught the exact measure of its equivalence in cents. In the second year, however, he may learn such simple equivalents as two nickels and a dime, two halves or four quarters and a dollar.

Abstract Numerical Ideas.—In the second year should be made the first definite efforts to make number ideas abstract. There is no special mystery about the process. Number ideas become abstract just as other ideas do.

If it were possible for a child to know but one cow, no doubt the word cow when mentioned or thought of in the absence of the animal would call up a more or less distinct visual image of it; but in actual experience a child learns to know many cows differing much in size, shape, and color. As a natural consequence, the word loses its attachment to that particular image except when there is special demand for it, and it becomes possible for the child to think of cows with the help of the name, or symbol, without imaging any cows at all.

In a similar way, varying the objects with which pupils do their number work tends to make the number ideas abstract and prepares the pupils to use number symbols intelligently without reference to objects.

Without the ability to abstract number, number knowledge must remain on a low plane, must lack flexibility, and skill in application must be very limited. To work with figures never associated with numerical ideas is stupid and vain; yet to do nothing but add, subtract, and multiply sticks may make a good stick counter, but never a good mathematician. Good number work begins in the concrete, grows rich by proceeding to the abstract, and keeps alive and useful by application to the concrete again.

Use of Figures.—While pupils are studying concretely the numbers from ten to twenty, they should learn to perform operations with figures in the numbers passed

over as well as to indicate with figures the operations performed concretely. In the latter part of the year they may go a step further than this, and with figures work beyond the range of their concrete work.

They can be easily taught to do this. When a pupil has once learned that $8 + 4 = 12$, 1 ten and a 2, it is not difficult for him to see that $18 + 4 = 22$, 2 tens and a 2. All that is involved in the addition of any two numbers that do not carry the sum beyond the next higher group of ten, is involved in the addition of any two numbers between one and twenty when the sum does not exceed thirty. Similarly, subtractions that do not lower the minuend beyond the next lower group of ten are all illustrated in the subtraction of numbers from one to twenty.

ADDITION AND SUBTRACTION TABLES.—In the second year, also, may be begun the practice of making and repeating convenient arithmetical tables.

Addition tables are made by adding the numbers from 2 to 9 successively to the numbers ranging from 1 to 9. At first the sums should approximate 20, and after a time 25, then 30, and so on until a reasonable limit is reached.

Additions of 2 will make the table 1, 3, 5, 7, 9; 2, 4, 6, 8, 10, etc. Commencing at higher numbers will vary the exercises. Addition of 3 will make the table 1, 3, 7, 10, 13; 2, 5, 8, 11, 14; 3, 6, 9, 12, 15.

Each addition table may be profitably reversed and so changed into a subtraction table.

These tables are to help pupils to skill in the performance of operations, and they should, therefore, be made with words and figures.

MULTIPLICATION AND DIVISION TABLES.—Two or three of the simplest multiplication tables should also be constructed by the pupils and committed to memory. With figures the work may be done thus:

$$2 + 2 = 4;\ 2 \times 2 = 4.$$
$$2 + 2 + 2 = 6;\ 2 \times 3 = 6.$$
$$2 + 2 + 2 + 2 = 8;\ 2 \times 4 = 8.$$

After a time the multiplication tables may be supplemented with the corresponding division tables, made in this manner:

$$2 \times 2 = 4;\ 4 \div 2 = 2.$$
$$2 \times 3 = 6;\ 6 \div 3 = 2.$$

Or it may be done in this manner:

$$2 + 2 = 4;\ 2 \times 2 = 4;\ 4 \div 2 = 2.$$
$$2 + 2 + 2 = 6;\ 2 \times 3 = 6;\ 6 \div 3 = 2.$$

In the third year the addition and subtraction tables may be extended to 50 and even 100 and the multiplication and division tables to 12×12, or nearly so, and work in the fundamental processes generally may be extended into the hundreds.

Use of Multiplication Sign.—The sign of multiplication is now used in two ways. Three times two may be written either 2×3 or 3×2. The first is consistently read two multiplied by three; and the second, three times two, though the first may also be so read. It should be borne in mind that in any series of operations the use of the sign should be the same throughout. The power of choice should never be used in such manner as would destroy the logic of the solution.

In determining, for instance, the cost of 7 yds. of calico at 8 cts. a yard, the seven should always be in the minds of the pupils as the multiplier.

In the formal solution of problems in which it is convenient to change the multiplicand to the multiplier, the logic of the operation should be expressed. The cost of 26 yds. of calico at 8cts. a yard is the same as that of 8 yds. at 26 cts. a yard, and the statement may be written accordingly:

$$8 \text{ cts.} \times 26 = 26 \text{ cts.} \times 8 = 208 \text{ cts.}$$

What is thus lost in time is gained in clearness of arithmetical thought, and rapidity of operation can be developed with supplementary drills.

Arithmetic as Science.—Throughout, even mechanical processes should have behind them an understanding of the operations represented. When the time spent at school by a large majority of pupils was shorter than it is now, this rule would not have been a wise one, as serviceable skill in practice would often have been sacrificed in an effort to impart scientific knowledge that would have been rendered vain from lack of time to complete it.

Apparently the only allowable departure from the rule at present is in certain cases of mensuration, for the understanding of which a knowledge of Geometry is necessary.

MAKING ADDITION AND SUBTRACTION INTELLIGENT PROCESSES.—Teaching the pupils from the beginning, in the ways already indicated, that eleven is a ten and a one, at once introduces them to the simple beauty of the Arabic system of notation, and prepares them to understand the fundamental operations.

Taught with sticks, $9 + 8 = 17$ becomes a bundle of ten with seven loose sticks. Conversely, to take eight from the seventeen, it becomes necessary to break the bundle of ten and make the seventeen a collection of sticks. Such exercises make the teaching of carrying in addition and borrowing in subtraction a simple matter.

Carrying the illustration further, 18 sticks, a bundle of ten with eight separate, added to 14 sticks, a bundle of ten with four separate, = 2 tens and 12 separate = 3 tens and 2 separate. It is easy from this to pass to $18 + 14 = 32$ and its explanation: 4 units + 8 units = 12 units, 1 ten and 2 units, and this 1 ten + 1 ten + 1 ten = 3 tens, making the sum 3 tens and 2 units, or 32.

It is through such exercises that problems like $60 - 27$ become intelligible. It is not possible to take away 7 units, as the problem asks, when there are no units indicated from which to take them, but a ten borrowed from the 6 tens, yields 10 units, 3 of which are left when the seven are taken away. This leaves 5 tens from which to take away 2 tens as demanded by the problem. Thus is obtained the remainder, 3 tens and 3 units, or 33.

UNDERSTOOD MULTIPLYING AND DIVIDING.—The knowledge thus begun should be carried into multiplication and division as it frequently is not. Pupils should know why they perform as they do, such operations as this:

$$\begin{array}{r} 624 \\ 27 \\ \hline 4368 \\ 1248 \\ \hline 16848 \end{array}$$

In the partial product 4368, the 6 is not six as pupils generally state it, but is 6 tens. $7 \times 4 = 28$, 8 units and 2 tens, $7 \times 2 = 14$ tens. Adding the 2 tens obtained from 7×4, gives us 16 tens, 6 tens and 1 hundred.

In the partial product 1248, the 8 is written below the 6 because it indicates 8 tens, the product of 20×4, 2 tens times 4. The cipher is not written because unnecessary.

Similarly pupils should learn to know that

```
27) 57834 (2142
    54
    ---
     38
     27
    ---
     113
     108
    ----
      54
      54
     ---
```

=

```
27) 57834 (2000
    54000   100
    -----
     3834    40
     2700     2
    -----
     1134  2142
     1080
    ----
      54
      54
     ---
```

Without learning to know this, they miss the science and beauty of the operation.

Number Analysis.—The knowledge pupils have of the place value of figures should be confirmed by frequent analysis either made for its own sake or as an incident in the explaining of operations. Over and over again numbers like 37 and 42 should be read as 3 tens and 7 units, 4 tens and 2 units; and numbers like 324 and 458, as 3 hundreds, 2 tens, and 4 units, 4 hundreds, 5 tens, and 8 units. Sometimes the analysis may be extended: 37 may be read not only as 3 tens and 7 units, but also as 30 units and 7 units.

First Fractional Units.—As is the case in measurement with integral units, so also must basic knowledge of measurement with fractional units be learned concretely. Here it is again wise to follow the natural growth of the child's experience, though it seems to run counter to the demands of abstract science. The child does not first learn fractional parts of measured integral units, but of such as are, arithmetically speaking, unmeasured. Its knowledge of fractions begins with the division of sticks of candy, of apples, of cakes, and the like.

First Lessons.—Concrete work with fractional units may begin in the latter part of the first year in number work and continue until numbering with ½, ⅓, or ¼ becomes as natural to the child as numbering with 1, and ⅔, 2/4 and ¾ are as natural as 2 apples or 3 apples.

Nothing is more convenient for first lessons or more in harmony with the child's own experience than sheets of paper. They can be folded so as to be cut into equal divisions, and the relation of the parts to the whole can be easily kept in mind.

A sheet exactly doubled and cut along the line of folding yields *two equal* parts. The attention of the pupils can be fixed on the *two* and the *equality* by means of questions. After the cutting the teacher may ask how many parts he has made. After placing the parts one over the other, matching them exactly, he may ask which is the larger or smaller part, to emphasize the equality. This is preparation for the statement that when a thing is cut into two equal parts, each part is called one-half of the whole. Thirds and fourths may easily be taught in the same way.

The Writing of Fractions.—It is important to teach the writing of fractions in such way that from the beginning the functions of the denominator and the numerator shall be clearly distinguished. Beginning with the writing of the half to indicate the half sheet of paper, it is well to ask again into how many pieces the sheet is divided. After the answer 2 is given, the teacher may state that the division into 2 parts may be indicated in this manner, $\frac{}{2}$, the line indicating division, the 2 indicating the number of parts made. This should be enough to enable the pupils to show on the board in the same way divisions into 3, 4, 5, or any number of parts.

To teach the numerator, let the teacher take two of three parts into which a sheet has been cut, after first indicating the division under the direction of the pupils. Two questions now are proper: 1. "How many parts have I?" 2. "How shall I write this?" The pupils may themselves think of the way to do it. If not, the teacher may show them, and the pupils read the fraction. One

and three of the parts may be treated in the same way, and many other numbers of different fractional parts.

First Operations.—It is evident that with such materials simple concrete additions and subtractions of fractions are easy, as also some multiplications of fractions by whole numbers, and divisions by fractions. With divisions of paper sheets or drawn lines, fundamental work in reduction may also be done advantageously. The very act of making quarter sheets can be made to show that ½ equals 2/4, and, therefore, also that ½ + ¼ = 2/4 + ¼ = ¾. A line divided by means of a string, first into halves and then into fourths, ——+——+——+——, will serve the same purpose.

Division.—In this concrete way the method of dividing with fractions becomes plain. When sheets of paper or lines are divided into halves, each furnishes 2 halves, two furnish 4, three furnish 6, and four furnish 8. So it becomes evident that there are twice as many halves in 1, 2, 3, and 4 as there are ones. In other words, $1 \div \frac{1}{2} = 1 \times 2$; $2 \div \frac{1}{2} = 2 \times 2$; $3 \div \frac{1}{2} = 3 \times 2$; $4 \div \frac{1}{2} = 4 \times 2$.

When a number of sheets are cut into thirds, pupils easily discover that 2 thirds are found in 4 thirds twice, in 6 thirds three times, in 8 thirds four times, so they are prepared to notice that 2 thirds are contained in a given number of thirds, or similarly in a whole number, only half as often as 1 third; that is, $4 \div \frac{2}{3} = (4 \times 3) \div 2 = 4 \times 3/2$.

Analytically stated, the fact is that since there are 3 thirds in 1, there are 3 times as many thirds in a number as there are ones, and since 2 thirds are twice as many as 1 third, 2 thirds are contained in a number only ½ as often as 1 third. Therefore, $4 \div \frac{2}{3} = 4 \times 3/2$.

To divide with a fraction, invert the divisor and use it in this inverted form as a multiplier.

Fractions of Numbers.—Lessons in fractions of things introduce pupils to lessons in fractions of numbers. Four has 2 twos, so 2 is one of the 2 even divisions of four, and ½ of 4 = 2. Thus the relationship of fractions to division becomes apparent and a new table becomes

possible: $4 \div 2 = 2$; ½ of $4 = 2$; $6 \div 2 = 3$; ½ of $6 = 3$.

Fractions of the highest type are the fractions of definite measures, the ½ foot, ½ pound, and ½ yard. These can be used in many fractional measurements that will yield the best results, especially as they are objects measured by numerical divisions. The foot is at once a single object and 12 inches.

DECIMAL FRACTIONS.—Good teaching of decimal fractions must be based upon a clear knowledge of the place values of whole numbers. Not only must the pupils know that figures are arranged in the order units, tens, hundreds, and thousands from right to left, but it must be clear in their minds that the place value of a figure to the left is ten times as great as that of the next figure on the right and, conversely, that the place value of every figure beginning on the left and moving to the right is 1/10 as great as that of the next figure on the left. A ten is 10 times as great as a 1, a hundred is 10 ten times as great as a ten, and a thousand 10 times as great as a hundred; and therefore a hundred is 1/10 as great as a thousand, a ten, 1/10 as great as a hundred, and a one, 1/10 as great as ten.

To impress these facts thoroughly on the minds of pupils, they should frequently multiply numbers by 10, 100, and 1000 by adding ciphers on the right and explain the process; and similarly divide numbers ending in ciphers by 10, 100, and 1000 by erasing the required number of them.

When pupils once surely know that each place to the left of units multiplies the value of the place next to it on the right by ten, it certainly should be easy to make them realize that each place to the right of the units divides the value of the place next to it on the left by ten and that a period, or decimal point, is placed after the units to separate the fraction from the whole number; so the order is, *hundreds, tens,* UNITS, *tenths, hundredths.*

Pupils should not be required to perform operations with decimals until they can rapidly and accurately write and read such combinations as 467.5, 27.07, 3,784.004, 605.702, and state on demand the place value of any figure in the combination. It seems that the first work should

be to multiply and divide by 10, 100, and 1000 by simply moving the decimal point and adding such ciphers as may be necessary.

There is nearly always too much hurry to teach the mutations of simple fractions to decimals and of decimals to simple fractions. There will be ample time to teach the necessary mutations after the decimals are perfectly familiar.

Definitions and Rules.—Advanced arithmetics are not complete without carefully stated and accurate rules and definitions. Teachers sometimes are tempted to teach from them and so make their work mechanical, and this is frequently urged as an objection to the rules and definitions themselves. The objection is not valid. While it is true that the first important thing for the pupils is to learn the nature of the processes and to become accurate, clear, and sure in their thinking, yet the rules and definitions are very valuable as summaries of what the pupils have learned and as a means of definitely conserving it.

Applications of Arithmetic.—No other branch of mathematics is so directly connected with the transactions of every-day life, and it is very wrong not to make the pupils skilful in the common practical uses of their knowledge. These applications are so varied and some of them so foreign to the ordinary experience of the pupils, that the difficulty of teaching arithmetic successfully is very much increased by them.

It should be made the rule that practical applications are not to be taught until the transactions to which they are to be made are well understood. It is a good thing at times to turn the school into a business house in which different forms of business are transacted, and at other times to take the class where they may observe the operations in which arithmetic is used.

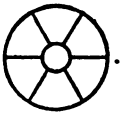
Mental Arithmetic.—It sometimes seems a pity that text-books in mental arithmetic have almost disappeared from our schools. They not only afforded excellent discipline in attention and the carrying power of the mind, but the method of analysis employed was also a wonderful help to clear and independent arithmetical thinking. Every teacher of arithmetic should take hints

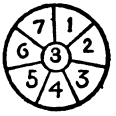
from the old standard books in mental arithmetic and supplement the written work of his pupils with exercises similar to those they contain.

DRILLS.—No other branch of study, except language, demands so much patient, intelligent, persistent, and varied drill as arithmetic. It must be patient, because so much is needed and the results are so elusive. It must be intelligent, that it may be economical, accomplish maximum results with minimum effort in minimum time. It must be varied to keep it alive.

These drills are of two kinds. They must have for their principal objects the development either of mechanical skill in operations or of readiness and accuracy of logical thought.

Mechanical Drills.—A few exercises in the mechanics of arithmetic have become standard. A good teacher can invent many more.

A common device for drill in addition is a sort of number wheel  . It can be used either for objective addition or for addition with figures. The objective addition disks of colored paper may be pasted in the divisions of the circle in this manner . Varying numbers of disks may be fastened in the central division with pins, and the pupils requested to add to the central numbers the numbers in the outer divisions as pointed out.

The same thing may be done with figures, varying the figures in the centre 

.

The same device may be used for combined addition and subtraction drills. The pupils may add the numbers

in the outer divisions when pointed to and subtract the numbers in the central division whenever the pointer tells them to do so.

Frequently, addition and subtraction problems should be dictated for either written or mental solution and the pupils encouraged to vie with one another in efforts to be the first to give accurate answers.

Advanced classes may be taught to add two columns at a time. There is great practical advantage in this, and it is really not so difficult as it may appear. In the addition of two successive numbers there never can be more than one to carry to the next column, and a glance will tell whether this must be done or not. In adding $\begin{smallmatrix}34\\23\end{smallmatrix}$ there is nothing to carry and the addition is done from left to right, as the result may then be written. When the numbers are $\begin{smallmatrix}57\\24\end{smallmatrix}$ the trained eye immediately sees that one must be carried to the tens, and the result may again be easily written from left to right.

Only one more difficult combination of two numbers consisting of tens and units can occur, and that is when both columns exceed ten in the sum, as with $\begin{smallmatrix}87\\69\end{smallmatrix}$. With practice the difficulties of this combination soon disappear.

When more than two numbers are to be added, the same possibilities are repeated from one sum to the next number, but no others occur.

In teaching multiplication and division, it is not sufficient to drill the pupils in the successive products and quotients of the tables. They must be drilled in these operations also with the order of the numbers broken as much as possible, until they can accurately and promptly state or write the products or quotients of any two numbers given. This skill can come only through persistent variation of drill.

When, in multiplying or dividing, pupils are unable to find the products or quotients at ready command, it is perfectly proper for them to work them out. Strokes may often be used for this very conveniently, if the

results cannot be discovered by addition or repeated subtractions. The product of 7×3 can be found by counting the three sevens, ////// ////// //////. The quotient of $12 \div 3$ can easily be found by pointing off the 3's in 12, /// /// ///. Continued subtractions of three will bring the same result, $12 - 3 - 3 - 3 - 3 = 0$.

THOUGHT SKILL.—Many exercises for the development of skill in arithmetical thought can be made by using x as in Algebra to represent a number to be found. The solutions must be by arithmetical analysis. In the problem $x + 7 = 15$, if seven must be added to the number represented by x to make 15, then the number must be 7 less than 15, $15 - 7$, or 8. There are fine possibilities in such exercises both for arithmetic and for preparatory work in Algebra. By way of suggestion consider these problems: $9 - 3 = x$; $8 - x = 5$; $6 \times x = 48$; $54 \div x = 9$.

Always the teacher should be ready with problems, both abstract and concrete, to supplement those in the book. Such problems may serve as drill exercises or as tests of the genuineness of the work done by the pupils. Frequently the weak pupils of a class get the solutions of problems in an assigned lesson from their stronger classmates and commit them to memory, thus defeating the purpose of the lesson. Generally speaking, the solutions of problems are worthless except as tests; the power to think out the solution is the valuable thing.

Supplementary problems, involving the same principles as do those previously assigned, throw the pupils on their own resources and discount shoddy work and evasion. Often when a class assembles for recitation it is sufficient to give the pupils opportunity to present the difficulties which they were unable to contend with successfully, and, after giving such help as may be needed, put them to work on supplementary problems during the rest of the period.

EXPLANATIONS.—In addition to supplementary problems, explanation of work done is always a useful test of its character. In early classes these explanations should not be formal. They should be answers to vital questions.

In advanced work the explanations may be—better, perhaps, should be—formal and often written, but even then careful questioning is often needed. The solutions of concrete problems should have sufficient abbreviated statement to reveal to the eye of the teacher the logic of it.

PROOFS.—From the beginning pupils should be trained to make simple but reliable proofs of their work. If they are trained in habits of clear thinking and careful proof, they need depend but little on the answers given by the author of the book. They become independent and self-reliant. That is the desirable result of teaching, to create the faculty to do instead of seeking to get over pages and chapters.

Algebra

In Arithmetic the number and variety of practical applications obscure the scientific side of the subject; sometimes they almost obliterate it. In Algebra and Geometry this is not the case, though both branches may be deformed into mechanical grinds. With intelligent handling, they are princely in dignity and yield princely returns to the student's efforts. To pupils in secondary schools they offer what is most beautiful and beneficial for discipline in mathematical reasoning processes, and no other studies surpass them in demands for strenuous effort to ensure mastery.

Both Algebra and Geometry are vitally connected with important practical needs, but for the majority of students their claim to attention is mainly in their disciplinary value. After all, the search for truth is the most worthy and inspiring activity of the student, and no search for truth justifies itself more immediately and in more satisfactory manner than does the search for mathematical truth.

No matter how varied its relations may be, a mathematical problem, whether in Algebra or Geometry, when considered by itself, is a thing complete. It presents definite quantities under such conditions that they challenge the mind to intense activity in efforts to determine their functions and relations to one another, and these also are definite. Because of this definiteness and complete-

ness, the result is a feeling of satisfaction that a difficult piece of work has been well done and a revelation of new truth that elates the mind and inspires to further effort. If any studies can establish themselves without connection with practical needs, Algebra and Geometry must be considered foremost among them.

THE BASIS OF ALGEBRA.—Algebra began in the generalization of numerical quantities and operations. It became, therefore, a study of the functions of numerical magnitudes or of such magnitudes as lend themselves to numerical measurements, and has for its ultimate object the solution of equations. It has led, however, to the discovery of qualities and functions of quantities but remotely implied in arithmetical operations and but faintly suggested by them, and has been further expanded by the transformation and new combinations of its formulæ. All this has added to the interest and value of the science, but increased the difficulty of its definition.

FUNDAMENTAL FEATURES.—Some of the fundamental features of the science are evident in a simple problem like $(a—b)\ (a—b) = a^2 — 2ab + b^2$. A and b are expressions of numerical generalizations inasmuch as they may represent any numbers whatsoever, and the product is correct for any numerical values that may be assigned to them.

Inasmuch as *a* and *b* may represent any numbers, they vary the product as different values are assigned to them. In other words, they represent variable functions. To solve the problem by translating it into numerical notation by assigning different numerical values to the letters, is to find their varying functions.

The idea of function is well illustrated in problems of time and rate. A man walks at the rate of three miles an hour. In three hours he walks nine miles, in four hours he walks twelve. So the time is a function of the distance, and the distance is a function of the time. They vary by mutual dependence on one another.

NEGATIVE QUANTITIES.—Problems in Algebra involve treatment of negative quantities. The negative quantity is suggested by numerical operations, but becomes a clear and distinct fact first in Algebra. It is, therefore, always

strange and somewhat perplexing to beginners in the study.

To help them, a foundation for the comfortable use of such quantities may be laid somewhat in the following manner. A man's estate is settled. His personal property and real estate are appraised at $45,000 and his debts amount to $35,000. Does the settlement find him even in his debit and credit accounts, or ahead in property? How much ahead is he? What is he worth? Another man's estate is settled. His property is valued at $12,000 and his debts amount to $28,000. Is he even in his account? What is he worth? With what mathematical signs may we indicate that one man is $10,000 ahead while the other is $16,000 behind?

A business man clears $560 one day, $340 the next, loses $800 the third day, gains $50 the fourth day, and loses $75 the fifth. With what signs might we mark these different amounts to show whether they represent gain or losses? What is the most convenient way to determine how the merchant stands with respect to his gains and losses in these transactions? How would we mark the result of the operations?

THE EQUATION.—In its strict sense the term equation is not applicable to every expression of equality. It applies only to expressions of equality presenting problems for solution. An equation always contains one or more quantities whose value is to be determined by the solution of the equation.

INTRODUCTION TO THE EQUATION.—Pupils first meet the equation in the primary arithmetic class when they are given simple exercises in addition and subtraction like these: $6 + (?) = 20$, $(?) - 4 = 8$. When spoken these problems read, "Six plus what number equals twenty?" "What number minus four equals eight?" Now what harm can come to the work if an x is used in the written statement instead of a question mark or some other device to indicate the number to be discovered?

The use of x to indicate the unknown quantity would be a first step in the teaching of Algebra, and the arithmetical solution of the problem should make another. There is logic in the solution, "If some number minus

four is eight, that number must be four more than eight; eight plus four, or twelve," and it is through the thoughtful solution of such problems that meaning is given to the algebraic rule for changing the signs of quantities in transposition. Without a basis in such logical solutions the rule is purely mechanical and is mechanically applied.

The value of these early solutions may be still better appreciated when it is remembered that the most direct algebraic solution of such problems is not by the method of transposition, but rests on the axiom that when equals are added to or subtracted from equals the results are equal. Thus instead of having $x - 4 = 8$, $x = 8 + 4 = 12$, we have $x - 4 = 8$, $x - 4 + 4 = 8 + 4$, $x = 12$. Such solutions naturally tend to become mechanical, and mechanical solutions are the common bane of Algebra.

Other Arithmetic Problems.—Another preparatory step is found in arithmetic problems like this: "John has a certain number of cents, Willie has twice as many, Mary has three times as many, and they together have 78; how many has each?" Why not from the beginning teach the pupils to use x in the solution to indicate the fundamental unknown number?

$$\begin{aligned} &\text{Let } x = \text{John's number.} \\ \text{Then } &x + 2x + 3x = 78, \\ &x = 13, \\ &2x = 26, \text{ Willie's number,} \\ &3x = 39, \text{ Mary's number.} \end{aligned}$$

This practice would not in the least change the character of the solution, would give the benefit of the algebraic shorthand, and would give a helpful sense of acquaintanceship with Algebra to beginners of its regular, formal study.

Kinship to Arithmetic.—It is easy in the teaching of Arithmetic to find many opportunities to use algebraic methods to the advantage of both the present study of Arithmetic and the future study of Algebra. The branches are so closely related that both suffer if their kinship is not well maintained. Even if it is not brought forward sooner, a recognition of this kinship should be shown by

teaching Algebra through the last year in which Arithmetic is taught, and all through the course in Algebra there should be much translation of problems arithmetically stated into algebraic form for algebraic solution. This is needed to keep the algebraic work wholesome by keeping it above the mechanical. It also gives value to the algebraic formulæ used in physics and related sciences.

Relation of Parts in Algebra.—Elementary Algebra is so closely bound to the study of equations that it is sometimes called the science of the equation. Most of the lessons, therefore, form series ending in discussions of equations of certain types. Every group in the series is intended to prepare for successful work in the next group or groups. The teacher should keep this in mind, for it is generally true that the problems given by the text-book in the groups are not sufficient for the purpose. The given exercises must be freely and judiciously supplemented.

It is useless to expect success in the teaching of multiplication and division when the pupils have failed to master the principles and practice of addition and subtraction.

So, very generally, pupils have trouble with factoring, one of the very important subjects in Algebra because of its relation to the resolution of equations, not because the exercises are not carefully arranged, but because of lack of sufficient intelligent drill in multiplication and division. The best evidence that a subject has been successfully treated is readiness for the something beyond.

Frequently, mistakes are made in the arrangement of problems in a given series. A few problems that closely resemble the type form are abruptly followed by problems that overwhelm the pupils with perplexing combinations. It is always well to remember that the type forms present the elements of algebraic theory, and that this is the first thing for the pupil to master. Complexity of combinations in problems is for the sake of mental gymnastics. This is a good purpose, but a secondary one. Difficulties in operations should be introduced judiciously. A sudden strain jars and weakens.

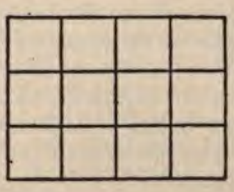
Geometry

THE SUBJECT.—Geometry is the science of space magnitude, or extension. Its facts are few in number. It treats of solids, surfaces, lines, and points. These are suggested by the forms of objects, but they are purely ideal entities and, therefore, definite and exact. A solid is a limited portion of space, not a body existing in space; surfaces are boundaries of solids, not portions of objects; lines are boundaries of surfaces, not chalk marks; and points are ends of lines, not dots. These ideal quantities have certain qualities and relations. The discovery of these and the demonstration of their existence is the office of the science.

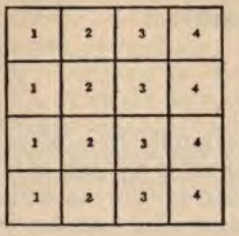
FORM STUDY IN THE KINDERGARTEN AND GRADES.—Preparation for the study of Geometry begins in the Kindergarten. Children there must study and handle objects that suggest geometric figures, like spheres, cylinders, and disks. They also sew and draw the outlines of such objects, and model their forms in clay.

This study of form should be continued and added to in the grades. By the time pupils reach the ninth grade they should be perfectly familiar with the geometric figures, the triangle, square, cube, prism, circle, cylinder, sphere, pyramid, and cone, and all their principal modifications. In order that their ideas may be definite and vivid, they should make illustrative models of the forms out of cardboard.

FIRST DEMONSTRATIONS.—When the study of Arithmetic brings pupils to practical measurements, they should not merely work the problems by formulæ, but they should also derive these formulæ by means of such measurements as are possible and proper at that stage of development.

A figure like this  will help to the

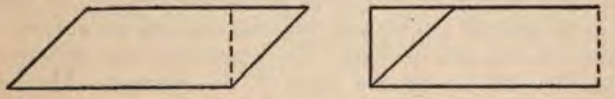
formula for finding the area of a rectangle, and if deemed necessary another like this



will aid in applying the principle to the square rectangle.

$$4+4+4+4=16;\ 4\times 4=16.$$

Parallelograms not rectangular may be illustrated with cardboard figures, and the rule for finding their areas derived by means of a little cutting and placing.



The rule for the areas of triangles may be similarly derived from the relation of the triangle to the rectangle.

If a rectangular figure like the above is cut out of cardboard and divided as indicated, by superposition the triangular pieces can be shown to be equal and the surface of each, therefore, equal to half the square, ½ (base × altitude). By performing the operations it will appear that base × ½ altitude amounts to the same thing.

A simpler thing to do than this, though further removed from geometric demonstration, is to cut out a right-angled triangle and cut it in two, parallel with the base at

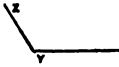
half the altitude. When the two parts are properly placed together they will form a rectangle just half the altitude of the triangle.

If the pupils have been trained to make cardboard models of solid figures, it is an easy matter to work out the formulæ for the contents of a number of solids. Sand may be used as a measurable content to test the calculations and the formulæ.

This work in practical measurement is the direct introduction to the systematic study of geometric demonstration, which should begin about the time that the regular study of Arithmetic ends and should proceed for a time side by side with Algebra.

DEFINITIONS.—In Geometry, definitions do not have the same status as in the physical sciences. The latter serve as general guides and summaries, and are at best but tentative and provisional. In Geometry, the definitions with the axioms are the basis of the science. They determine the magnitudes or qualities of magnitude whose relations are to be ascertained. It is imperative, therefore, that they be both complete and exact. There can be no exact reasoning on inexact and indefinite data, nor can exact conclusions be drawn from them.

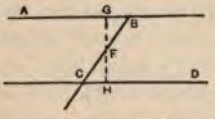
THE ORDER.—It should go without saying that the lessons in Geometry should form a logical and symmetrical series. The pupils should be able to give good reason for every step they take, and as they advance, gain deeper and more widely connected and inspiring views of mathematical truth.

As contributing to the system and order that belong to the science, the method of reading angles of the same class in the same way is commendable, the positive angles in the order contrary to the movements of the hands of a clock, and the negative angles in the reverse way. Thus in the figure 

, the $\angle XYZ$ is the obtuse angle and the $\angle ZYX$ is the reflex angle.

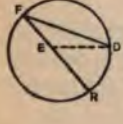
THE METHOD.—The method of geometric discovery is the method of reasoning. Whatever other method may be used at any time is but occasional and incidental. The process of reasoning is the process of mediate judgment. In its simplest form, geometric reasoning is represented by the formula $A = C$, $B = C$ $\therefore A = B$. Whenever the geometer wishes to determine the relation of two quantities to each other, his first search is for a third quantity related to both in such a way as to be fitted to serve as a medium of comparison.

In the theorem, for instance, "If two parallel lines are cut by a transversal, the alternate interior angles are equal," one method of demonstration is to draw a perpendicular to the parallel lines through the middle point of the transversal measured between the parallels. Why is it done? The figure helps to answer the question.



We wish to prove that $\angle ABC = \angle DCB$. We draw the perpendicular GH through the middle point F in the transversal BC. We do this to construct two triangles, $\triangle BFG$ and $\triangle CFH$, so related that they make possible the determination of the relation of the angles in question. The triangles are our third term, our medium of comparison. In these triangles $\angle BFG = \angle CFH$ because they are vertical angles, and $\angle FGB = \angle FHC$ because they are right angles. This proves that $\angle ABC = \angle DCB$, inasmuch as they remain after subtracting equals from equals, from the 2 $\underline{\lfloor S}$ which the sums of the interior angles of the triangles respectively equal.

The theorem, "An inscribed angle is measured by one half its intercepted arc," illustrates the same principle in a more complicated way.



We wish to prove that $\angle RFD$ is measured by ½ arc RD. We seek a medium because there is no direct means of determining that this is true. There can be formed an angle

measured by the arc RD. That will serve as a third term, if we can determine its relation to ∠RFD. It is the central ∠RED which we construct. The figure plainly shows that we can establish the relation of ∠RFD to ∠FDE by means of the △DEF, which thus in turn becomes a third term, or means of comparison. △DEF is isosceles, because two of its sides, EF and ED, are radii of the circle. ∠RFD, therefore, equals ∠FDE. These angles equal $2 \angle^{S} - \angle DEF$, but $\angle RED = 2 \angle^{S} - \angle DEF$; therefore, $\angle RED = \angle RFD + \angle FDE$. The latter angles are, however, equal, therefore $\angle RFD = \frac{1}{2} \angle RED$ and is measured by ½ arc RD.

Benefits of the Study.—For most pupils it is only as they go through such processes that they derive any lasting benefit at all from the study of Geometry. Comparatively few of the formulas derived in the course of the study have direct practical use even for a small minority of a class. The ability to repeat the statement of a demonstration mechanically has no use whatever except to help a student through a very superficial examination.

How to secure genuine work and develop the power of geometrical reasoning, is always a problem for the teacher. Contrary to a very common belief, Geometry has in itself no magical power to make pupils think. For many it is much easier to commit demonstrations to memory than to think them out. People are apt to follow lines of least resistance. Skilful leading to the discovery of truth alone can inspire to the effort that will overcome resistance and finally satisfy.

The Text-book.—In order to make sure of the proper effort and desired results, it has been proposed to set aside the text-book and have the pupils develop the Geometry themselves under the guidance of the teacher. The proposition has been tried, and the method is the common one in some countries. The result is, generally, that the teacher becomes a substitute for the text-book, entailing for the pupil much loss of time and independence of effort.

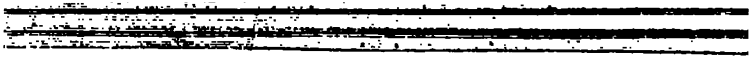
It seems better to introduce students as rapidly as possible to what is fundamental in the reasoning processes of Geometry, to require of them a good reason for every

statement made unless it involves a deadening repetition of a fact clearly established, to explain only those things in the book demonstrations which the pupils cannot reasonably be expected to discover for themselves, to require the working out of as many original theorems and problems as possible, and to encourage the working out of original demonstrations in addition to those given in the text. In many cases a few hints will enable pupils to do this.

It is well sometimes to change the letters that mark the parts of figures, or the system of marking them, as by substituting figures for letters. Sometimes it is helpful to change the position of figures. Always it is well to question closely in order to test the work thoroughly and make the students feel that none but genuine work will pass.

PART IV

THE PRACTICAL ARTS



CHAPTER XXI

THE MANUAL ARTS

THE manual arts are Penmanship, Drawing, Modelling, and the different forms of handiwork embraced in the terms Manual Training, Industrial Training, and Vocational Training. For some of these branches of activity there is increasing theoretic and practical demand. This demand arises from a better understanding of their influence on individual development and a keener appreciation of their relation to the industries of the nation and its commercial status.

GENERAL USE.—The manual arts are forms of motor activity and natural means of self-expression. They are important sources of satisfaction in self-increase, and a proper incentive thereto. They cause us to enjoy being more because they enable us to do more and to do what we do with greater skill and a fuller realization of usefulness and beauty.

In lower animals sensor excitement ordinarily leads to immediate reflex or instinctive motor responses. In consequence, the motor areas of the brain develop symmetrically with its sensor areas, as does also the whole motor apparatus of the body. So every lower animal is, within the range of its capacity, a complete creature.

With men, thought and feeling intervene between sensor excitement and motor reaction. This makes possible a wider, higher, and more complicated range of activity, but it necessitates education to perfect thought and feeling and to train to adequate and suitable forms of expression; for expression completes thought and feeling just as the simple motor reactions of the animal complete the circuit of its nerve excitement.

Expressive activity develops the motor areas of the brain and has a reflex effect upon the sensor areas. Without it, they are arrested in development, thought becomes indefinite, and feeling abnormal. Healthy and vigorous mind growth is always connected with ambitious and en-

thusiastic doing. The mind of the thinker who is not a doer or who does not plan and direct the doing of others, stagnates or becomes visionary.

THE BASIS.—If commenced at the proper time, nothing is more easily taught than the school arts or more quickly brings satisfactory and inspiring results. Children are instinctively artists and makers. They are all fond of picture cutting, coloring, and drawing. Little girls sew dresses for their dolls, and a boy five years old reaches the heights of boyish happiness when he receives a box of carpenter's tools for a present.

Nearly every man who was born in the country or a small town often reverts in mind with quiet satisfaction to the time when as a boy he built wagons, carts, and wheel-barrows for himself, and recalls the pride he felt when he was hauling sand or dirt in them. In that far-away time, also, no sport gave more solid happiness than coasting the snow-tracked hill on the sled his own hands had made.

Penmanship

It is very common to regard penmanship a merely incidental matter, and yet good teaching of it yields immediate practical and cultural results that are by no means trifling. The ability to write neatly a letter of friendship or affection and to keep plain, legible accounts, must be regarded as a valuable attainment.

CONDITIONS TO GOOD PENMANSHIP.—Good penmanship is not a gift, nor does it come by chance. It is the result of much patient, enthusiastic, and well-guided practice that conforms faithfully to certain conditions imposed by the structure of the body, the nature of mind, and the character of the material used.

These conditions may be summed up in the general statements:

1. Exact vision.
2. Æsthetic taste.
3. Correct position.
4. Freedom of movement in response to ideas of form.
5. Proper pens, ink, and paper.

The last condition may be dismissed with a few words.

It is not possible to learn to write well on paper that is not firm and smooth without being glazed, with ink that fails to flow freely and make distinctly visible marks, or with pens too coarse and heavy of stroke.

The exact vision is produced by the careful analysis of correct models of form, perfected by the comparison of the results of much practice.

MOVEMENT AND POSITION.—The movement comes by practice and is absolutely dependent on position. Position is, therefore, of fundamental importance.

There are two positions that permit of proper movement, the front and the side. The front is preferable whenever the table or desk is wide enough. The side position should be used only when that is not the case, or occasionally for the sake of restful change. For both positions the feet rest squarely on the floor with the left slightly in advance.

The Front Position.—In the front position, the body is square with the desk or nearly so, very near to it but not touching. It is nearly erect, leaning forward a very little and slightly to the left to rest lighty on the left arm. The arms rest obliquely on the desk, the elbows projecting about two inches. This is so, because it is absolutely necessary that the right arm, at least, rest on the muscles of the forearm so that it may have proper motion. The paper should be nearly in front of the body and turned slightly to the left so that its edges will be parallel with the arms. The left hand holds the paper in place.

Side Position.—In the side position, the body is as nearly upright as in the other, but the right side is turned to the desk and near it. The paper and right arm, parallel with each other, are nearly or quite parallel with the edges of the desk. The left hand, supporting the paper, rests near the front edge.

PEN HOLDING.—The pen is held between the thumb and second finger, crossing the second finger at the root of the nail. The first finger rests on top of it. The thumb and fingers are bowed easily and naturally so as to be entirely uncramped in movement. The pen extends upward and backward so as to cross the first finger just in front of the knuckle joint or just back of it. The third and fourth

fingers are turned well back and under the hand so far to the left that the hand rests on the nails of these fingers and the pen points to the right shoulder. Both the side of the hand and the wrist must be well off the paper. No other positions of wrist, hand, or fingers can give the desired results.

THE MOVEMENTS.—For all ordinary penmanship the fundamental movement is on the muscle of the forearm. This is the movement for capital letters and nearly all the short small letters. For the long small letters and the upper extensions of s and r, the muscular movement may be supplemented with movements of the fingers grasping the pen; but finger movements should never be other than supplementary.

In ornamental penmanship, capital letters and flourishes are sometimes made with a movement of the whole arm entirely free of the desk. At a blackboard, of course, the writing is all done with whole-arm or combined whole-arm and finger movements.

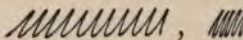
FIRST WRITING.—In the first two grades and partly in the third, the writing is little better than drawing, and should be done with the pencil. It consists mainly in copying exercises first written on the board by the teacher. This writing should receive careful supervision with particular reference to position and neatness. The positions then assumed tend to become habitual, and strongly influence the future efforts to develop skill in writing. It must also be remembered that the best positions for writing are the correct positions for health.

If pupils find it difficult to grasp the pencil or pen properly, an exercise may help them much. Have them stand with hands hanging by the side as limply as possible, the back of the right hand turned forward, and hold the pencil easily with the proper fingers, resting it in the hollow between the thumb and first finger and letting it cross the second finger at the root of the nail. Now have them raise the right forearm until it forms a right angle with the upper arm, gently bending the fingers which hold the pencil as they do so. They will thus assume the proper position for writing and be uncramped. A few movements in the air like those made in writing will be helpful.

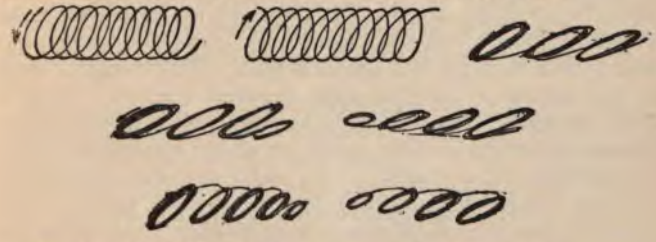
MOVEMENT DRILLS.—When pupils begin to write in copy books with pens, if not before, drills in movement should begin and be continued with perseverance and enthusiasm. Skill in writing demands a free use of paper other than that in the copy books.

The general movement drills are drills in the making of horizontal strokes, and up and down strokes, and in the forming of ovals. In all the drills the stroke should be as light as possible.

For the horizontal strokes the limits should be lined with a pencil from three to six inches apart. The pupils make the strokes from limit backward and forward, commencing with a stroke from left to right. When finished, the work will look something like this:

When the drill is intended for slant writing, drills in the making of up and down strokes should give the proper slant to the lines, like this:  .

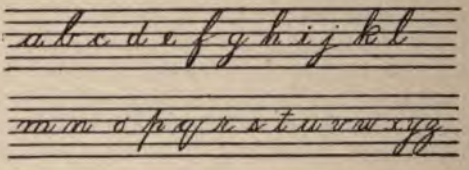
The oval exercises admit of much variation, and demand it. The ovals should be made both with the forward stroke and the reverse, with intervals between and on the same line, and with increase and decrease of size.



Looped ovals may also be used to advantage.

These exercises are designed to make movement easy and yet measured with the eyes. They should all be made with the muscular forearm movement.

In addition to these general drills, special drills are needed. These a study of the alphabet will suggest. A chart of it like the one here given should be before the pupils when they write.

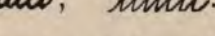


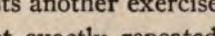
Such charts cannot be rightly used as absolute measures of the letters. They indicate properly only their relative sizes. The absolute sizes should vary with the ages of pupils and with physiological differences among those of the same age. Young pupils naturally write a larger hand than older pupils, and they should be permitted to do so. The larger muscles become effective before the smaller accessory ones, and the capacity of the eye for delicate accurate vision normally increases with age. If pupils naturally write too large a hand for neatness and economy, they can be led gradually to reduce the size.

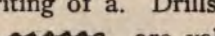
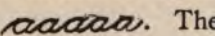
THE RULES FOR HEIGHT.—The chart indicates the rules for height. In the slant system of penmanship all the small letters not furnished with loops and stems, except s and r, have the same height. This height, from an old system of penmanship, is called a space. B, h, k, and l are three times as high, having loops extending two spaces above the middle space in which the short letters are written. The small g, j, y, and z are also three times as long, having loops extending two spaces below. The f has a two-space loop above and another of equal length below. The letters t and d are both twice as long as a, while the stem of p extends one space above and a space and a half below. The stem of a q also extends a space and a half below.

SMALL LETTER DRILLS.—An analysis of the small letters reveals the fact that they are formed by combining a few simple elements, slightly modified in some of them. These elements are a straight line, /, a right curve,), a left curve, (, an upper and a lower link, ∩∪, and a small crotchet, as at the end of *w*.

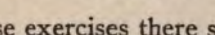
These elements do not separately lend themselves readily to useful drill, but simple combinations of them do. One of the simplest of these combinations is found in the letter i, and it is repeated in the upper part of j, in the u and the w. When lengthened it forms all of the t except the cross and, with a slight modification, the upper part of the p. This serves as a cue to several drill exercises, repetitions of the strokes in the i and the t:



The first combination in m is found in the n, the h, the p, the first part of the v and the y, and in the upper part of the z. This suggests another exercise,  .

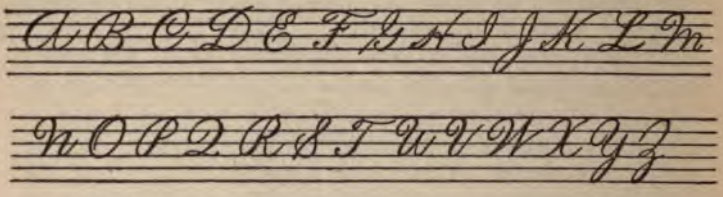
While the o is not exactly repeated in other letters, skill in making it nicely is somewhat difficult to acquire and it aids in the writing of a. Drills in series of o's, therefore, like this,  , are valuable. In these drills attention should be given to the intervals between the letters to cultivate the habit of regular spacing. Series of a's are also good,  . The a recurs in d, g, and q.

The l is repeated in b, f, h, and k, and the lower loop, j, is found in f, g, j, y, and z. This makes good drill series,



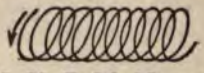
In addition to these exercises there should be drills in series of all the small letters with particular care in the spacing, as .

THE CAPITAL LETTER DRILLS.—The capitals present problems of their own. A chart of them is also useful to reveal the relative sizes of the letters and their parts, and to suggest needed drills.

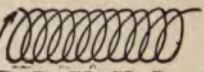


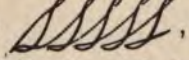
All the capitals should be made strictly with the forearm movement. The type of movement, however, differs with different sets of letters.

In A, E, O, C, D, and G, the movement is mainly that of the direct oval. While studying these capitals, different forms of direct oval drills should be frequent.

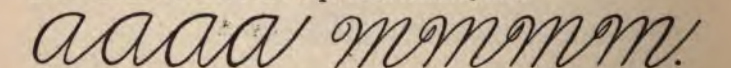


In Q, U, V, W, X, Y, Z, M, N, and, in a modified way, in I and J, the dominant feature is the inverted oval; and these letters, therefore, demand inverted oval exercises.



In T, F, R, G, P, B, H, K, L, and in S, the double curve, or line of beauty, is a special feature. This is hard to make well, and needs much drill. A series like this,  , will be helpful.

With the capitals as with the small letters, there should be drill series of all the separate letters, like



In conducting the drills counting is an important part of the teacher's business. This fixes the rate of speed and gets the pupils into the swing of the movements. This is

particularly helpful to pupils who are inclined to be slow and awkward of movement and who are apt to draw letters instead of writing them. For most letters the count is easy to manage. For a series of small i's, omitting the dots, a count of two will do, one for the up stroke and two for the down stroke. For an h a count of four is needed. The rate should increase with the growth of skill.

CONCLUDING REMARKS.—Since written recitations have become common, the pupils do more writing in the other classes than in the penmanship class. The latter has thus become the special drill class and the free practice is done in the other classes. If this is there allowed to be done carelessly, the work of the penmanship class is largely nullified.

It must also be remembered that the copy book is not the main factor in the teaching of writing. It serves principally as a guide and as a record of progress. This latter is particularly the case when the pupils write over only half the page the first time through the book and complete the page in a second series of lessons. Always the main dependence must be on practice sheets.

Drawing

The pupils in our schools need training in the art of drawing for a number of reasons. The school itself, in the first place, has an ever present demand for skill in the art. For many purposes drawing is the best form of expression that can be put in the power of the pupils. Almost every day they may use line, shaded, or colored drawings to describe objects or narrate events. No words will serve to describe leaf of tree, petal of flower, wing of bird and butterfly, implement of war and peace, or shape of island and continent as may the pencil and brush. If stories may not be so plainly told with them, yet illustrations give a reality to the past in time and remote in place that otherwise may not be.

Pupils need lessons in drawing, too, as a means of cultivating æsthetic taste. This is one of the basic needs of life. It purifies and refines life. It increases its dignity, and adds to its enjoyment. It adorns the home and its environment, fills it with music, and makes beautiful its

manners. It causes men to find a source of rapture in the blush of dawn and the glory of sunset, and wherever in the sky above or the earth beneath they may turn their eyes.

There is still another urgent reason for teaching drawing, a very practical one. Society must recruit its artists, architects, engineers, and industrial designers from the boys and girls who pass through the schools. So there must be in the schools picture-making, mechanical drawing, and ornamental designing, and much of this may be correlated with manual training and take meaning and life from it.

GUIDE TO FIRST LESSONS.—When children enter the first grade, they like to make pictures and tell things by means of them. They have their own peculiar way of doing this, and it is sometimes hard to tell how they come by it. Sometimes they teach it to one another. However they come by it, pictures of unschooled children the world over bear close resemblance to one another and to those of primitive people.

In making pictures of objects, children do not follow their outlines closely, but represent them with a sort of conventionalized symbolism. A person's head is like this, , while the heads of many animals are represented by figures like this, . A house is shown with entire disregard of the rules of perspective. The people who are supposed to occupy it, are out of all proportion to its size, and the furniture inside is plainly visible from without.

FIRST LESSONS IN DRAWING.—However crude the drawing of children may be, that is the kind of drawing to encourage them to do when they first come to school. Let them tell with pictures in their own way the interesting things they do at home. They can thus tell how they play, how they sweep the floor, chop wood, carry the baby, rock it to sleep, feed the chickens, and many other things. They can picture their homes, the furniture in them, the Christmas tree, and the pet animals they have.

Similarly they may illustrate stories which are told them or which they read. If these stories tell of objects with which they are not familiar, the pupils may be shown pictures of them, but their illustrations should be drawn afterwards from memory just as are the pictures of objects with which they are familiar. The pictures so drawn may be shown side by side with the originals, but they should not be closely criticised.

If the teacher is not too exacting, the pupils may already in the first grade begin to make pictures of one another at rest and in action. These first pictures of the kind are best made in mass with brush and water colors or ink, or with colored crayons. The object of this mass picture-making is not accurate portraiture, but it is intended to accustom the pupils to representing the parts of the body in proper setting and proportion.

A girl writing at the board makes a good subject. Her hair is nearly all that is seen of her head, and her dress, legs, and feet are easily pictured. The most difficult thing to do is the arm and hand raised for the writing.

A more difficult subject, but possibly a more interesting one, is a boy running. One of the boys may run across the room in front of the class until the other pupils have caught the poise of his head, the slope of his back, the set of the leg touching the floor, the set of the other leg, and the position of the arms. The running boy may sometimes try to stop in such way as to show the positions plainly.

After a time pupils may draw such pictures in outline with their pencils. All drawing from pose cultivates the art spirit, and prepares for good work in illustrating.

For this early work the materials used are Manila drawing paper and Japanese rice paper, pencils, soft crayons, white, black, and colored brushes, water colors, ink, and charcoal.

The First Instruction.—The first instruction in drawing should be a purely incidental matter, mainly in the form of suggestion. When pupils bring pictures of brooms, shovels, or hatchets, for instance, drawn in the usual crude manner, the teacher may place the objects themselves before the class and show how to picture them with charcoal in mass. The pupils will quickly catch the

suggestions in his work and will soon do remarkably well with much satisfaction.

If the pupils draw pictures of birds in the usual way, something like this, , the teacher may bring some cage bird, say a canary because of its solid coloring, and have them study its form and color. After attention has been directed with proper questions to the size and shape of the bill, head, body, wings, tail, legs, and feet, and the colors of the parts, they may picture it with colored crayons, drawing in mass.

The teacher may have to show how the work is done, but should, in that case, remove his drawing from sight before the pupils begin theirs.

THE NATURE STUDY CLASS.—No work that pupils do can make them more accurate in indicating the form and color of objects than that of the Nature Study class. This demands a careful study of form as a means of distinguishing objects and of understanding the adaptation of parts to functions. This attention to form and color not only tends to make knowledge of them definite, but also to make this knowledge interesting; and in drawing as in speech, children can tell best what they know best and enjoy most in the telling.

Leaves and flowers make good subjects for drawing, as do birds and butterflies. This drawing may be done in the mass, and much of it should be; but some of it should be done with pencil outline, as this makes careful exactness in form habitual. Much artistic taste may be developed by encouraging the pupils to make the setting and grouping of the objects they picture beautiful and attractive.

ILLUSTRATIVE DRAWING.—Illustrative drawing may begin quite early. Much of the best of this may be based on the holidays and other secular and religious festivals in which the pupils are specially interested. These drawings may be made the means of cultivating a taste for ornamental designing and skill in execution. A series of drawings to illustrate the seasons, Thanksgiving, and

Christmas, with suitable borders done either with colored crayons or water colors may be made to have the highest value.

THE TECHNIQUE.—As the work advances, it will be found desirable to give special drills for the development of technical skill and knowledge. These exercises should be incidental. Picture-making is the main source of interest. The enthusiasm that attaches to skill is subordinate to it, and grows only with critical power.

From the beginning there should be drill exercises in the freehand production of lines, straight and curved, vertical, horizontal, and oblique. In the drawing of straight lines, at first dots may be used as guides, one for each end.

Very early also there should be exercises in the different methods of shading with pencil and crayon, and, after a time, also with water colors. The shading should at first be very simple. It should be done with drawings of familiar objects pronounced in form, like balls, cylinders, fruits, and utensils cylindrical in shape.

The lessons in shading may soon be followed by simple pictures with masses of light and shade and with masses of color. Such pictures, if carefully guided in the making, have a great value. They teach artistic strength and harmony.

PERSPECTIVE.—When pupils draw cubes and buildings, they create a need for the beginning of instruction in perspective. The guide to proper perspective at first should be the eye, and not a rule or set of rules.

The teacher himself may draw a cube out of perspective and ask whether it looks right, and how it might be made to look better. By shifting the lines representing the top and visible sides, and varying their lengths with judgment, the figure may at last be brought to have the right shape to the eyes of the pupils. This will prepare them to make right shapes in such drawings for themselves.

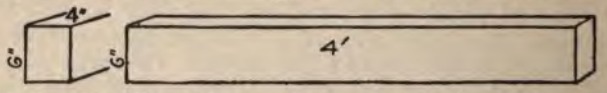
An imperfect drawing of a house or barn may be used in the same way. There will be plenty of such in the work of the pupils. In both cases, they should be referred to a cube or house or barn to find a basis for criticism and correction.

Gradually, as need arises, as it will with outdoor sketching, all the elements of perspective may be introduced, the convergence of lines toward the centre of vision, the dropping out of objects and details, and the increasing faintness of line, shade, and color. Excellent lessons may be made of straight lines or railroads, especially of roads with telegraph or telephone lines on both sides.

USE OF DRAWING BOOKS.—Once it was customary to teach drawing with drawing books alone. Pupils taught to draw in that way, while they might learn to copy pictures with a fair degree of success, seldom acquired skill in drawing that had any practical value. Worst of all, they did not learn to see things with the eye of the artist. In the reaction from the method we are inclined to discard the drawing book altogether. For the ordinary teacher this is not wise. Drawing from the book may be an excellent supplementary exercise, furnishing as it does graded lessons in technique. These are very valuable.

MECHANICAL DRAWING.—Mechanical drawing is best taught in connection with manual training. It does not demand a high degree of artistic skill. Perspective and shading are but little used, and then only incidentally. It is mainly a matter of understanding the facts and principles of construction and skill in the use of a few instruments.

The purpose of a construction plan is to show plainly the shape of every piece that enters into the making of an object, to indicate its dimensions, and to show also the shape and dimensions of the completed structure. There must, therefore, be drawings of the different faces.



A drawing like this may be used to indicate a squared timber 4 by 6 inches in transverse measurement, and 4 feet long.

DESIGNING.—We have already seen how designing may be introduced in the making of season and festival announcement cards. Good lessons in the art may also

be connected with the ornamentation of objects made in the manual training class, or with the preparation of patterns for embroidery and other forms of embellishment in the domestic arts class. Much designing may also be done in an independent way merely for the sake of doing it. A successful design is a very satisfying thing, even if it cannot be put to immediate use.

In manual training work, most of the designs are for borders, corners, or the centres of panels. Borders are either simple straight lines, or modifications and combinations of them; simple or modified geometrical forms in contact series or connected with lines; series of natural objects, like leaves, flowers, fruits, vines, or conventionalized forms of them. Corner pieces generally are modified geometrical forms; clusters of fruits, leaves, or flowers; human heads, or graceful animal forms. The centres may be human or animal figures; whole plants, or clusters of fruits or flowers; special emblems, like flags; or pictured scenes selected for their beauty or symbolic meaning.

For designing there must be dictation exercises for suggestion and guidance, but the originality of the pupils should be given free play, and should be challenged to the fullest extent. The designs should be adapted to the shape of the object, the character of the material, and the use for which the object is intended. They should be accurately drawn, symmetrical and graceful of form, and harmonious in color.

The training designing affords has a direct influence on the beautifying of the home and the objects of daily use, and it may be the basis of special training for a highly remunerative art.

MANUAL TRAINING.—When the value of motor activities in the education of children is considered, several important facts come into view.

Our social life is changing, and changing in such a way as to do vital injury to the race if the conditions are not intelligently met. From being a people engaged in out-of-door pursuits, as we once chiefly were, we are largely become a people accustomed to be cooped up in towns, factories, flats, parlors, and club rooms. The children lose

outdoor exercise and the incentive and opportunity for making things. More and more, therefore, we need manual training in our schools to prevent the physical, intellectual, and moral atrophy of the children.

We also need it to keep the growing generation in healthful sympathy with the nation's industries, to improve these industries by increasing the taste and intelligence of the demands made upon them, and to prepare a large body of well-trained youths from whom to recruit the workers.

So the demand for manual training in the schools is both theoretic and practical, both individual and social, and will culminate in different forms of vocational training.

The Course.—In the larger cities manual training is a simple matter. The boys and girls like the work, the schools are equipped for it, and specially trained teachers are employed to direct it. In many schools work is done in clay, raffia, paper, cardboard, leather, wood, and metal, both with and without machinery.

The smaller towns and the rural districts are not equipped for work at all, or but to a limited extent. While the need there is not yet so great as in the cities, is it not true that even the country boy who makes his own wagons and sleds could make them better with a little training, and could besides learn to make many more things both for pleasure and profit? If trustees of schools will not recognize this, it is still possible for teachers to teach hand work without other tools than such as boys are sure to have or can easily get. There can be work in cardboard, raffia, and reeds, and in wood, as far as woodwork can be done with the knife.

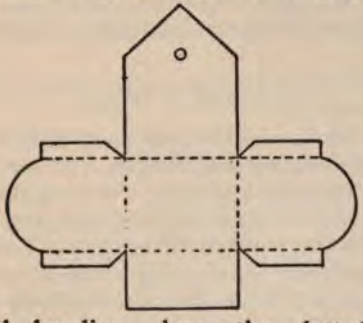
The Fundamental Principle.—No matter how wide or narrow the range of work may be, every lesson should offer the pupils one or more incentives to do the work carefully and with enthusiasm. They should be called upon to make things which they need in their games and amusements, which will be of use to them at home or at school, or which will illustrate lessons.

In woodwork they should, of course, learn to saw straight, but they can best learn to saw straight when they

have boards to saw in making something. It may be necessary for them to practise on waste pieces of board before attempting to saw the board they wish to use, but the incentive to practise comes from the wish to saw that board. So they best learn to plane smoothly and evenly and to make the different kinds of joints, scarfed, halved, mortise and tenon, dovetail, heading, butt, mitre, and cleated, when they need that sort of thing to make well something they are eager to have, and have made by themselves.

Things That May Be Done.—The mat-weaving of the Kindergarten may be continued in the first grade with more freedom and originality. It may later lead to the weaving of mat screens with reeds or sticks, and straw or raffia, and to basketry.

The making of geometrical solid forms may serve as an introduction to the making of useful articles out of heavy paper or cardboard, such as match holders, portfolios, card receivers and cases, and whisk holders. A match holder may be made by cutting a piece of paper like this,



creasing and bending along the dotted lines, and properly glueing together the parts bent. A card receiver may be made out of cardboard cut like this:

After the sides have been bent up on the dotted lines, colored tape or silk may be pasted over the joints. This may also be done over the upper edge. This will both hold the parts together and ornament the receiver. Instead of pasting on the tape, it may be sewed on.

Both the match holder and the card receiver may be made more attractive with bordering lines or figures put on with colored marking crayons or paint, and with ornamental pictures in the panel centres put on in the same way or pasted on.

To illustrate Indian life, a wigwam may be built. This belongs to first or second grade work, or even third and fourth.

Sticks will serve for the frame, and unbleached muslin will serve as cover material. Figures may be painted on this after the Indian fashion. To complete the illustration, bows may be cut out of suitable pieces of ash and fitted with arrows all properly barbed with iron and winged with feathers. Heavy cardboard or wrapping paper may be used to make quivers. These may be fringed with some bright material and ornamented further with crayons or paint.

With sticks and muslin, tents for campers and soldiers may also be made.

Clay may be modelled into geometrical forms, into fruit forms, into ornamental bricks, and into relief maps. It may also be used to model figures of men and animals, to make bricks for the building of houses and barns, and to make jars and other pieces of pottery. The houses and barns may be roofed with strips of wood cut from cigar boxes. The easiest way to make the pottery is the Indian mode of rolling the clay into coils and working one coil smoothly on top of the other. When a school is fully equipped, the pieces are easily glazed and burned, and may be decorated with lines and figures.

Much can be done with wood. It is surprising how many things that boys and girls like to make can be made with the aid of a knife, hammer, and glue-pot only, and with no other wood stock than that derived from cigar and crayon boxes and the bushes of the neighborhood. If other tools are added, work benches provided, and the

stock increased, the range of interesting work becomes very large.

With pieces cut from the branches of trees, leaving the bark on, beautiful rustic picture frames can be made. All that is necessary is to join carefully matched pieces properly together and cut neatly out of the back of the pieces sufficient material to make it possible to fit in glass, picture, and back and fasten them there.

With larger branches, a seven, eight, or nine year old boy, with very little help, can build a log cabin, put a chimney to it on the outside, furnish it with door and window frames, and fit in them doors and window shutters made of wood taken from boxes that may be had for the asking.

With light box materials may be made receptacles for combs and brushes, match safes, pencil boxes, cabinets, breeding houses for birds, and numberless other things.

As the pupils become old enough, if the equipment suffices, the school should help them to make sleds, carts, and wagons, and such things as cupboards, bookcases, stools, taborets, picture frames, presses for plant specimens, cabinets, apparatus for physical training experiments, tables, and benches.

Physical Training

Just as our mode of life creates a demand for manual training independent of our industrial needs, so it gives increasing importance to physical training. In a treatise of this sort, it is not possible to outline a course in such training; but it is still possible to say that every school, even if it has no well equipped gymnasium, should have at least such exercises as it can without apparatus.

The exercises described for increase of lung power and the management of breath in the chapter on reading, are valuable. Many other exercises may be added. All should be planned with reference to the physical condition of the pupils, and should have for their object the improvement of the functioning of the vital organs, increased action and development of the muscles, especially of those that ordinarily are little used, increased vigor and grace of movement, and greater ability to put mind into muscle.

The amount of mental training involved in well directed physical exercises becomes apparent to those who are in position to notice how much attention is necessary to coördinate complex series of movements and perform them promptly and accurately. Gymnastic training gives pupils command of their physical selves and tends to cultivate the type of mind that belongs to active, confident doers.

ATHLETICS.—What is true of indoor gymnastics is still more true of outdoor athletics and of indoor sports that, like basket-ball, resemble open air games.

The health and vigor that belonged to the open air activity of pioneer life, the quick accuracy of thought, the ready ability to translate the thought into effective action, and the wonderful self-reliance that came from meeting the emergencies of that life, these must largely come to young people of to-day through athletics.

When it is remembered that our popular games and sports involve intellectual training of a high order and may develop important moral qualities, such as enthusiastic and unselfish devotion to the interests of a team, a class, or school, the suppression of anger, jealousy, and hatred, the ability to play fairly and deal honorably with an opponent, it is evident that the school should cultivate athletic sports and so direct them as to ensure the best results, physical, intellectual, and moral, for all its pupils.

CHAPTER XXII

VOCATIONAL TRAINING

General Statement.—In a somewhat vague theoretic way we long ago accepted Cicero's proposition, "Non scholæ sed vitæ discimus." Of late years we have begun to realize the possible extent and definiteness of its application. We have made marvellous advance in the development of technical schools, and different forms of vocational training are being rapidly incorporated in our public school curricula. We shall be driven to still greater progress in the near future, if not by the logic of educational theory, then by the irresistible compulsion of modern conditions of life. The school must increase the efficiency of the farmer and the mechanic as well as of the physician and the clergyman.

We shall gradually become accustomed to treat a number of branches mainly as preparatory to vocational training, and modify the selection of materials and the method of teaching accordingly. So manual training may be made in some localities preparation for carpentering or cabinet-making, in others for the trade of the machinist or the smith.

For a number of vocations the training must be given almost entirely in special technical schools and by specialists. These it is not necessary to discuss in a work of this sort. But there are some which demand attention because they have such general value and because at least some of the necessary training is so easily and profitably incorporated with the general work of the school. Among these are book-keeping, journalism, domestic occupations, and agriculture.

Book-Keeping

There is always demand for good book-keepers, and every one needs the training. The habit of careful and accurate accounting tends to cultivate in all of us what we much need, economy in the management of our affairs, the

securing of maximum results with minimum expenditure of effort and money.

It is not to be doubted that if our farmers kept strict account of their business there would result astonishing revelations of wasted time, energy, and money that would tend to cause improvement of method and increase of returns. When once every field and every kind of stock has charged against it the interest on the investment, the taxes, all the labor devoted to it, and all the money expended upon its maintenance and cultivation, and is credited only with carefully measured actual returns, there will either be much abandonment of farming or a great revolution in the business.

The one thing confusing in book-keeping is the fact that the terms debit and credit not only refer to debtors and creditors and their dealings one with the other, but also indicate opposite sides of accounts when there are no debtors and creditors in the real meaning of the terms. The thing to do is to teach clearly the different kinds of business transactions and accounts, and have the pupils persist in making up accounts of each kind until the principle and rules that govern the debiting and crediting in an account of that kind become clear and fixed in correct habit. Accuracy and thoroughness are worth more than haste.

Much drill in the drawing up and handling of business papers like checks and notes is also necessary.

At times the pupils may be organized into business firms and become purchasers with much pleasure to them, and profit. Their accounts will give a new value not only to book-keeping, but also to spelling, penmanship, punctuation, and arithmetic

Journalism

Excellent training in journalism can be given as specialized composition work. Pupils can be taught to write news items, editorials, notices, and advertisements. This writing may be gathered in a school paper, and much of it may be published in local papers, so becoming a powerful stimulant to effort. If the school publishes a paper or magazine, the writing of advertisements may be made

still more business-like and prepare for profitable employment. All this writing reacts upon spelling, grammar, and rhetoric, and the writing of editorials may be so directed as to create interest in the live issues of the day.

Domestic Science

The home gives up its children to the school much of their active time, and it has a perfect right to ask what benefits it shall receive therefrom. The school cannot evade its obligations. It must enrich the home. The ultimate value of learning lies in its practical uses. The school owes to the home sane home makers and home keepers.

SANITATION.—The school must maintain conditions that conserve and develop the vitality and health of the pupils. This is fundamental. It should be done with their coöperation. To make the coöperation intelligent they must be instructed in the principles of sanitation. This involves the practical applications of lessons in physiology and hygiene, of lessons in chemistry, especially the chemistry of disinfectants, and of lessons in housecleaning. Supervision of the sports of the pupils is also needed in order that the best results may follow. Young people and older ones too are often careless of their bodies when heated by exertion.

All these things will react on their present home life and prepare them for sensible home life in the future.

ORNAMENTATION.—Another phase of house-keeping may be cultivated if botany, horticulture, drawing, sewing, and wood-working are taught. The pupils may make shelves and brackets for the walls of the school room, they may raise potted plants to make it homelike, make curtains for the windows, pictures and frames for the walls, and cupboards and cases for apparatus and books. They may also beautify the grounds with flower beds.

NEEDLE-WORK.—All forms of hand sewing, knitting, and crocheting may be taught with practically no expense to the school, provided the pupils are put to work on things useful for themselves or their families. This is, at any rate, the best thing to do, because they so find the greatest incentive to effort.

They can begin with simple things like handkerchiefs and aprons. They can be taught to make patterns for the latter and cut them as well as sew together the parts, and they can learn to hem and embroider both aprons and handkerchiefs.

Without special equipment all the simple forms of garments may be made, and with one or a few sewing machines all the parts of the dressmaker's art may be taught.

When table covers, curtains, cushions, pillows, and all other similar articles of home use and ornament are taken into consideration, there seems to be no end to the things that may be done under the guidance of a sensible and skilful teacher.

There seems to be no good reason also why our girls should not cultivate the fine art of lace-making, as well as the Indians of our own country and the peasant girls of Europe.

COOKING AND BAKING.—Cooking and baking should be taught as applied chemistry, physiology, and hygiene. The pupils should study particularly the chemistry of digestion, and the methods of analyzing foodstuffs to discover adulterations. They should learn to know the values of different articles of food, to apply this knowledge in the planning of menus for different kinds of people under different conditions, and to prepare the foods economically so as to secure the best results at the least expense.

If a school cannot afford the elaborate equipment specially prepared for the purpose, it is possible to achieve all the desired results with an oil or gas range, a sink, and a few tables. A fairly large class can be provided for at little expense, especially where pupils are obliged to lunch at school. They can so prepare for themselves more palatable and wholesome lunches than they could bring from home, and find added pleasure in the lessons.

Agriculture

GENERAL STATEMENT.—No other vocation is making such urgent and reasonable demands on the school as is agriculture, and no other so rapidly and richly justifies the attention it receives. The day for adding to our

tilled lands millions of acres for extensive farming has practically passed. Instead of keeping lines of ships employed in carrying cattle and grain and other foodstuffs from our land to Europe, we are importing meat, potatoes, butter, and eggs. Need makes us notice the impoverishment of our soil and the deficiencies of our methods of farming. Our acres should produce at least three times as much as they do. The records made by the boys and girls instructed in better methods of farming in and through our schools give abundant hope for the future.

Relation to Science.—With properly trained teachers, training for agriculture is easy in our rural districts, and in some branches of it, even in towns of considerable size. This is partly due to its relation to sciences already taught, like geography, botany, zoölogy, and chemistry. Without it botany and zoölogy especially are largely purposeless and ineffective. With its introduction they assume a character and value they never had before. Beginning with elementary Nature Study, the lessons may be selected and conducted in such way as to prepare for intelligent and enthusiastic farming and gardening. It is just as easy to study the character and growth and functions of plants, insects, birds, and other animals that are connected with our economic activity as it is to study others, and it is much more interesting and profitable.

Outside Coöperation.—Much practical work can be done in the school itself, much can be done with school gardens, and many rural districts can add a few acres to their school properties, as has already been done here and there. These school gardens and farm lands may be worked in such way as to earn sufficient to defray all the incidental expenses and leave a handsome sum for other purposes. But a great deal more can be done with the coöperation of the parents. Many pupils, with such help, can raise crops independently or go into the poultry or pigeon business, or combine the two, and all rural and village pupils can have the benefits of observation on nearby farms and vegetable gardens.

Lessons in School.—A number of lessons in soils are easily given in the school itself. First of all, the pupils may learn to distinguish the different kinds by

sight and touch. Second, they may observe the relation of the soils to moisture: the ease with which they are permeated with it, their capacity for holding it, and the conditions under which they best retain it or most easily part with it. For this a number of large bottles will be helpful. With the bottoms cut away by burning around them a string previously soaked in alcohol, they may be set inverted in a rack made for the purpose and filled with different kinds of soil, one with sand, one with gravel, one with loam, one with clay, and others with clay below and other soil above. Water can then be poured on the soils and the drip caught in cans below and measured. In a similar way may be taught the capacity of the different soils for retaining fertilizers and utilizing them.

A box with a glass end may be used to supplement such lessons. With packed surface, and pulverized surface, or surface mulched with straw, the different effects on evaporation may be noted.

Third, the relation of soils to plant growth may be fairly well observed, as similar seeds may be planted in boxes containing the different soils similarly treated.

Fourth, the effects of different fertilizers on these soils may be fairly well learned.

In school, the pupils may also be taught to make chemical analyses of commercial fertilizers and test their degrees of availability. Commercial fertilizers are frequently adulterated, and often the elements they contain are not available because they form insoluble or partly insoluble compounds.

In connection with these lessons much may be learned concerning the selection of seeds. Many kinds of seeds, especially of small seeds, have other seeds mixed with them, frequently of hurtful weeds. It is well to train the boys to detect these foreign seeds and form the habit of seeking them when sowing is done. The seeds may also be tested with reference to vitality. In this seeds are often poor. Sometimes no more than 75 per cent. will germinate, and sometimes the plants are feeble in growth. The percentage of germination may be easily determined by counting the seeds sown and the plants resulting. The character of the plants is easily noted.

With the selection of seeds may be coupled the treatment of them to prevent the diseases to which the plants are subject, as the spraying of oats with formaldehyde to prevent rust and the soaking of potatoes in a similar solution to prevent scab.

SCHOOL GARDENS AND FARMS.—If the school is fortunate enough to own a garden or a few acres that may be ploughed for farm crops, the work begun in the school may be much extended, and gardening and farming taught in a very practical way with reference to the demands of the neighborhood. The pupils may then also be taught the important business of marketing.

ORCHARDING.—Few public schools, if any, have orchards connected with them or are likely to have them, yet much of orcharding may be taught in a practical way. The principles of pruning may be practised on wild wood growths in the neighborhood, and the same is true of budding and grafting.

Success in the protection of trees and smaller plants against injury from insects and diseases depends upon a knowledge of the character and life history of the insects and diseases and of the action of the chemical compounds used to destroy them.

The teaching of the life history of insects belongs to zoölogy, and the nature of the spraying materials may be made a part of the chemistry study.

POULTRY RAISING.—Almost without exception pupils in the country and in small towns can have poultry yards of their own. The school can teach them the principles that govern the wise selection of stock with reference to laying and food values, and with reference to breeding. It can also teach them how to manage the broods, and how to house and feed the stock to keep it healthy and profitable. The money returns which the instruction assures increase the interest of the business.

CATTLE.—The waste of feeding inferior cattle is a source of enormous loss in our country. It is a very simple matter to teach the principles of successful dairying and to train boys to test the results of care and feeding. At a very small expense the country school can teach the practical use of such apparatus as the Babcock test, and so

become the means of weeding out the unprofitable stock of the neighborhood.

SPECIAL HELPS.—The whole business of teaching agriculture has been much simplified by the work of the national Department of Agriculture. Its bulletins not only tell what can be taught, but actually give detailed plans for the lessons and the making of apparatus needed. The work of this department is supplemented by that of similar departments and of agricultural colleges in the states. The plan of forming clubs, like corn clubs, potato clubs, and poultry clubs, has become very effective through its business-like methods and the prizes it offers.

PRINCIPLES AND BENEFITS.—The purpose of all vocational work is to train pupils to do things and do them intelligently. There must, therefore, be a maximum of practice and a minimum of instruction. This minimum of instruction must cover the most vital facts and principles, and the rules that are necessary guides to convenient and successful practice. So there will be a new interest in the common branches of learning and a new desire to know more of bird and beast and plant. There will result a more efficient generation of men and women, and their growth in efficiency will react upon the parents who send them to school, so that the child will teach the man and lead him in ways that are better and more pleasant than the old ones.

INDEX

A, b, c method in reading, 77, 78
Activity, Froebel's theory of, 62, 63
Addition, 248, 254, 261
  tables, 252
Adjectives, Latin, 154
Æsthetic culture, 6
  emotions, 17, 18
Agriculture, 300–304
  relation of, to science, 301
Aldine reading method, 84
Algebra, 263–267
  the equation, 265
  nature of, 264
  negative quantities, 264
  relation to arithmetic, 266
Analysis, 29
  grammatical, 140, 141
  of numbers, 255
  phonic, 86, 87
  rhetorical, 143
Annexation of states, 229
Apperception, 14
Appetites, 3, 34, 38
Applications of arithmetic, 259
Aquaria, 175
Arithmetic, 243–263
  abstract numerical ideas, 251
  applications of, 259
  Arabic notation, 249
  definition of, 243
  definitions and rules, 259
  ends of first lessons, 245
  first lessons, 246
  mental, 259
  number concepts, 246
  numbers, 244
  primary method, 247
  relation to algebra, 266
  simultaneous operations, 248
  tables, 252
  teaching of fractions, 256
  units, 244
Art, manual, 277–296
Articulation, 115
Athletics, 296

Baking, 300
Basis of manual arts, 278
Biography in history, 222
  in study of literature, 105
Biology, 165, 166
Birds, relation of, to insects, 179
  study of, 168, 176–180
Blend in reading, 87
Book-keeping, 297
Books, on insects, 272
  spelling, 148
  study of, in grammar, 139
    in science, 164, 165
  use of, in geometry, 272
  uses of, 45
Botany, 165, 183
Breathing, 112, 113
Breeding boxes, 175
Buds, study of, 173
Butterflies, study of, 174

Calisthenic drill, 111
Capital letters, 133
Cattle, lessons concerning, 303
Cause, of discovery of America, 228
  in history, 211
Circles, the great, 202
Civil government, 224
Climate, observational study of, 196
Climax in reading or speaking, 121
Cocoons, collection of, 175
Colonial home-life in America, 221
Colonies, American, 228
Coloring, 172, 200
  of maps, 208
Colors of birds, 177
Community life, 221
Compass, making of, 190
Composition, oral, 130, 131
  written, 104, 130, 142

Comprehensive reading method, 84
Concepts, 42
numerical, 246
Concrete work in arithmetic, 250
Conjugation of Latin verbs, 153, 154
Conquests, 216
Constitution, study of, 239
Construction, grammatical, 141
rhetorical, 144
Continents, location of, 184
relief of, 208
Cooking, 300
Correction, of composition exercises, 144
of grammatical errors, 135
Correlation, in advanced work, 32
of drawing, with geography, 200
with manual training, 291
with nature study, 172, 288
in elementary studies, 31, 32
of forms of expression, 32
of language, 126, 131
principle of, 26
relation of, to stages of growth, 27, 28
of studies, 28–31
Criticism of opinions in literature, 104

Definitions of arithmetic, 259
in geometry, 270
of grammar, 136
Designing, 290
Development, law of, 15
Devices, in geography, 202, 206
for number drills, 250, 257, 260
for teaching letter values, 82
Diagramming in grammar, 140
Dialogues, 93
Direction, geographical, 190, 202
Division, drills in, 261
by fractions, 257
of whole numbers, 249, 254
Domestic animals, study of, 168
science and art, 299
Dramatic representation, 111
Drawing, 69, 285, 291
of designs, 290
drills in, 289
first instruction in, 287
in geography, 200
of historical maps, 225
of historical pictures, 225
of maps, 200, 205
mechanical, 290
in nature study, 172, 288
in study of Latin, 156
use of lessons in, 285
Drill, definition of, 55
in grammar, 134
in Latin forms, 155
laws of, 53, 54
principles of, 55–57
reviews, 57
in words, 87

Economy in school exercises, 40
Education, definition of, 4, 5
growth in United States, 236
need of, 4
Educational theory, Froebel's, 61–64
guides to, 3
Elocution, nature of, 108
public performances, 125
Emotions, æsthetic, 17, 18
moral, 18, 19
religious, 19, 20
Emphasis, 121–124
Ends, of education, 5
of first lessons in arithmetic, 245
of first reading lessons, 75
Equations, 265
Equator, 202
Evolution of society, 212
Excelsior, the teaching of, 94–98
Expansion of U. S., lines of, 230
pathways of, 231
Expression, artistic, 22
correlation of, 32
in first reading lessons, 88
industrial, 22
law of, 22
school forms of, 23
value of, 23–25

Factors of history, 213–219
Family groups of letters, 80, 81
Feelings, 16
Field study, of birds, 178
of geography, 202, 206
Figures in primary arithmetic, 251
Figures of speech, 100
Foreign relations, effects of, 218
Fractional units, 245, 255
Fractions, decimal, 258
first lessons in, 256
notation of, 256
Froebel, Friedrich, 61
Functions, classification of, 4
relativity of, 3

Gardens, school, 303
Geography, 181–209
advanced, 209
content of, 183–189
elementary course in, 201–207
of Kansas, 181–183
local, 194–200
observational, 190–201
relation to mental activity, 189
Geometry, 268–273
definitions of, 270
first demonstrations, 268
method of, 271
German, first grammar lessons in, 160
first lessons in, 159
first reading in, 160
grammatical forms of, 159
Gestures, 110
Grade work, in arithmetic, 247–257
in geography, 201–207
in language, 132–135
Grammar, definition of, 136
of foreign languages, 153–155, 160
oral lessons in, 139
primary lessons in, 132–139
relation of, to literary study, 100
value of, 136

Habit forming, 58
Hawks, study of, 180
Helps to reading lessons, 91
Hero tales, 222
Highways of United States, 231
History, of England, 225
general and national, 210–240
of literature, 106
the scientific character of, 210
study of general, 224–226
teaching of, 219–240
universality of, 211
value of, 210
value of events in, 212
of United States, 223, 224, 226–240
Home life, study of, 221

Ideas, abstract numerical, 251
Illustration, 287, 288
Immigration, effects of, 219
into United States, 229
Incentives, 39
to habit forming, 58
to learn to read, 76
Individuality, 63
in United States, 238
Industry, expressions of, 22
relation of, to physical facts, 235
Insects, 168, 174, 179
Inspiration, 24
Instincts, 3, 34–38
racial, 220
Instruction, methods of, 41–45
nature of, 40
Intensive reading, 89
study of history, 240
Interest, multiplication of, 38
relation of, to action, 34
relation of, to instincts, 34

Kindergarten, the, 61
gifts of, 65–68
introduction to geometry, 268
occupations of, 68–71
songs of, 71

Laboratory work, 165
Land, forms and distribution of, 184

Language, foreign, 149–161
method of teaching modern, 157–179
picture lessons in, 130
relation of, to other studies, 126
special classes in, 129
study of, 126
Latin, arguments for, 150–152
declension and conjugation, 153
method of, 152
pronunciation of, 153
status of, 149
Literature, definition of, 89
first reading of, 99
of the reader, 88
principle of study of, 90
relation to language study, 127
structure of, 142
study of Latin, 155
Location, study of, 205

Manual training, 291–296
courses in, 292
principle of, 292
use of, 291
Maps, 200, 202, 205, 208
in history, 225
Match, the spelling, 148
Mathematics, 241–273
algebra, 263–267
arithmetic, 243–263
geometry, 268–273
value of, 242
Mechanical drawing, 290
Memorizing, by elocution students, 108
choice passages, 58, 93, 105
rules and definitions, 57
Mental arithmetic, 259
Method, in biology, 166
indirect objective, 41
in elementary history, 223
in geometry, 271
in grammar, 137
in modern languages, 157–159
in nature study, 170
in primary arithmetic, 247
lecture, 44
Method, objective, 41
of bird study, 178
of teaching reading, 77–88
Pollard, 80–84
question, 42–44
Middle ages, 222
Mind in relation to body, 5, 6
types of, 15
Modelling, 70
Modern languages, first grammar lessons in, 160
first lessons in, 159
first reading in, 160
grammatical forms of, 159
Moral emotions, 18, 19
training, 6
Moths, study of, 174
Mountains, influence of, 214, 230
observational study of, 197
Movement, drills in, 281
in penmanship, 280
Multiplication, drills in, 261
with fractions, 257
with whole numbers, 249, 254

Name, value of, 12
Nationality, growth of, in United States, 237, 238
meaning of, in history, 211
Nature study, 71, 167–180
drawing in, 288
method of, 170
relation of, to language, 131
relation of, to teacher, 167
scope of, 168
Needle-work, 299
Negative quantities, 264
New Education reading method, 84
New Gordon reading method, 84
Notation, Arabic, 249
of fractions, 256
Nouns, 139
Number, 243
abstract ideas of, 256
concepts, 246
fractions of, 257
writing of, 249

Occupations, kindergarten, 68–71
Oceans as historical factors, 214
Operations in arithmetic, 248, 251–258
Oral composition, 131
Outline for local geography, 198
Outlines for reviews, 57
in history, 224

Paper cutting and folding, 70
Paragraphing, 132
Parsing, 140
Pedagogy, branches of, 8
Penmanship, conditions for, 278
first lessons in, 280
movement, 280
position in, 279
Perception, nature of, 9–12
Personality, influence of, 16, 39
Perspective, lessons in, 289
Philosophy, Froebel's, 62
relation of, to education, 5
Physical factors, in growth of population, 213
in history, 213–215
in industry, 235
in intercourse of peoples, 214
of social development, 214, 215
Physical science, biology, 165
divisions of, 162
geography, 181–209
nature study, 167–180
physiology, 166
value of, 162–164
Physical training, 295
Physiology, 166
Pictures, in geography, 206
in history, 225
lessons with, 130
uses of, 42, 156
Pioneers, 222
Pitch of voice, 119
Play, Froebel's theory of, 64
instinctive character of, 36
Poetry, study of, 144
Political divisions, 189, 209
Pollard reading method, 80–84
Population, civilization of, 189
dependence of, on physical conditions, 188, 213
mixing of, in U. S., 231
movements of, 215
Position in penmanship, 279
Posture in reading, 109
Poultry raising, 303
Practical arts, 277–296
agriculture, 300–304
basis of, 278
book-keeping, 297
domestic science, 299
drawing, 285–291
general uses of, 277
journalism, 298
manual training, 291–296
penmanship, 278–285
Predicate, the, 138
Principle of manual training, 292
of vocational training, 304
Professional training, need of, 3
Pronunciation of Latin, 153
Proofs in arithmetic, 263
Punctuation, drills in, 133
uses of, 120

Quantitative ideas, 241
Quantities, negative, 264

Rain in relation to winds, 193
Rainfall, 208
Reading, ends of first lessons, 75
gestures in, 110
intensive and extensive, 89
methods of teaching, 77–88
of elocution students, 108
posture in, 109
supplementary, 98
thought in first lessons, 84
uses of, 75
Recitation, of reading lessons, 91
topical, 51, 128
Recognition, of numbers, 250
of words, 87
Religious emotions, 19, 20
literature, 20
Repetition, results of, 53
Reviews, 57
Revolution of the earth, 202